System T

Reference Manual

Solid State Logic

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PLEASE READ ALL INSTRUCTIONS, PAY SPECIAL HEED TO SAFETY WARNINGS.

E&OE

January 2024

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Introduction

About this manual

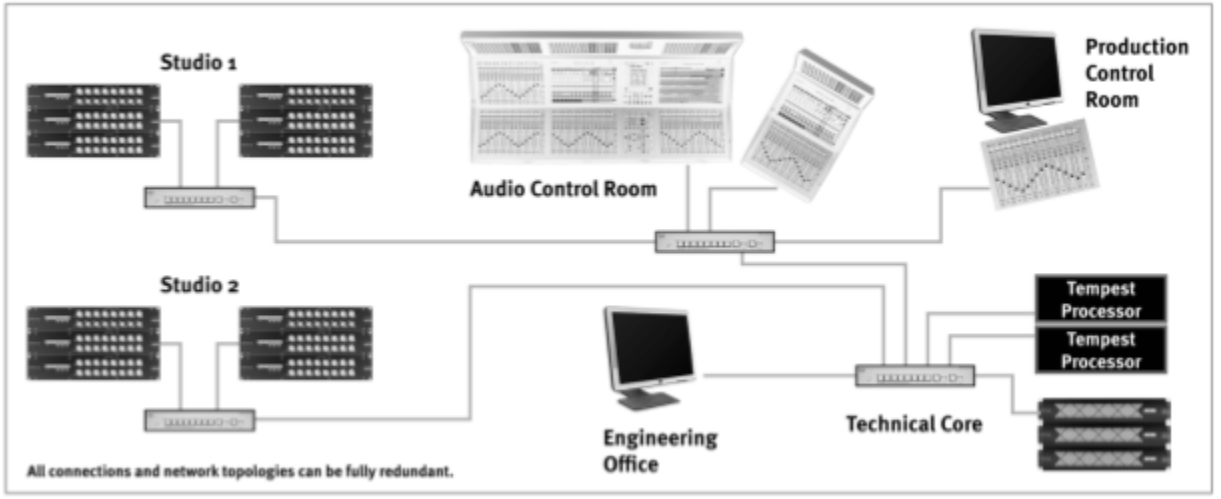
This manual is intended as an overview to the functions and structure of the System T console. System T is highly configurable and as such, system structures, set-ups and applications will vary for each installation. This manual is therefore intended to provide detail about the many functions within System T, rather than train the reader to use the system. That task is better undertaken with a personal training program which can be arranged by our team of dedicated training and support staff who can be contacted at www.solidstatelogic.com

The manual also assumes the System T has been installed and commissioned. If help is needed with this, then again contact support@solidstatelogic.com and also refer to the System T Installation Guide.

The manual is broken into functional sections, largely defined by the chapter headers. If you are reading this electronically, we have embedded hot-links and bookmarks to ease navigation for the user/reader.

System T Overview

System T is the first of a new generation of dedicated broadcast audio production systems from Solid State Logic. For more than 30 years SSL has been at the forefront of innovative broadcast console design, and has incorporated decades of research and customer feedback into the development of System T. True innovation in technology and conceptual design are combined within System T to deliver a whole range of advances:



- System T is a fully networked production environment. New ways to combine multiple Control Interfaces, Processor Cores and I/O devices can be specified to create previously impossible system configurations.

- Dante AoIP-based Routing & I/O delivers scalability, interoperability and discoverability. The Dante AoIP network integrates the AES67 transport standard. SSL's Tempest Engine uses patented Optimal Core Processing for real time CPU based mixing and audio processing.

- Audio quality and performance is exceptional. SSL's SuperAnalogue™ foundations combine with 64-bit floating point processing and mixing to ensure unlimited audio headroom with the power to execute algorithms within a single sample. Broadcast specific path processing is augmented by an inbuilt comprehensive FX Rack.

- System T's console control surface incorporates multi-gesture touch screen technology, greatly expanding the range of controls that can be quickly accessed from a reduced footprint. The console is configurable to suit individual preferences.

There are three main elements to System T: a Dante™ AoIP based Routing & I/O system which combines SSL's own Dante ready Network I/O range of audio interfaces, Tempest based rack mounted audio processors and control interface technology that combines large format consoles with remote hardware, software and touch screen technology.

Fully Networked Control Interfaces

System T has a new broadcast specific set of Control Interfaces that combine hardware panels with large tablet style multi-touch screens in a fully networked environment. Large format consoles can be combined with remotely located computers, or touch screen terminals and remote hardware panels. Up to three Control Interfaces can share a single processor engine simultaneously, facilitating for example, an entertainment production with one surface for a music mix and a second for a production mix using a single engine. Multiple engines can be connected to a single console VLAN and interfaces can be moved between engines. The various approaches to remote control capability enable true facility wide control infrastructure design.

Routing & I/O

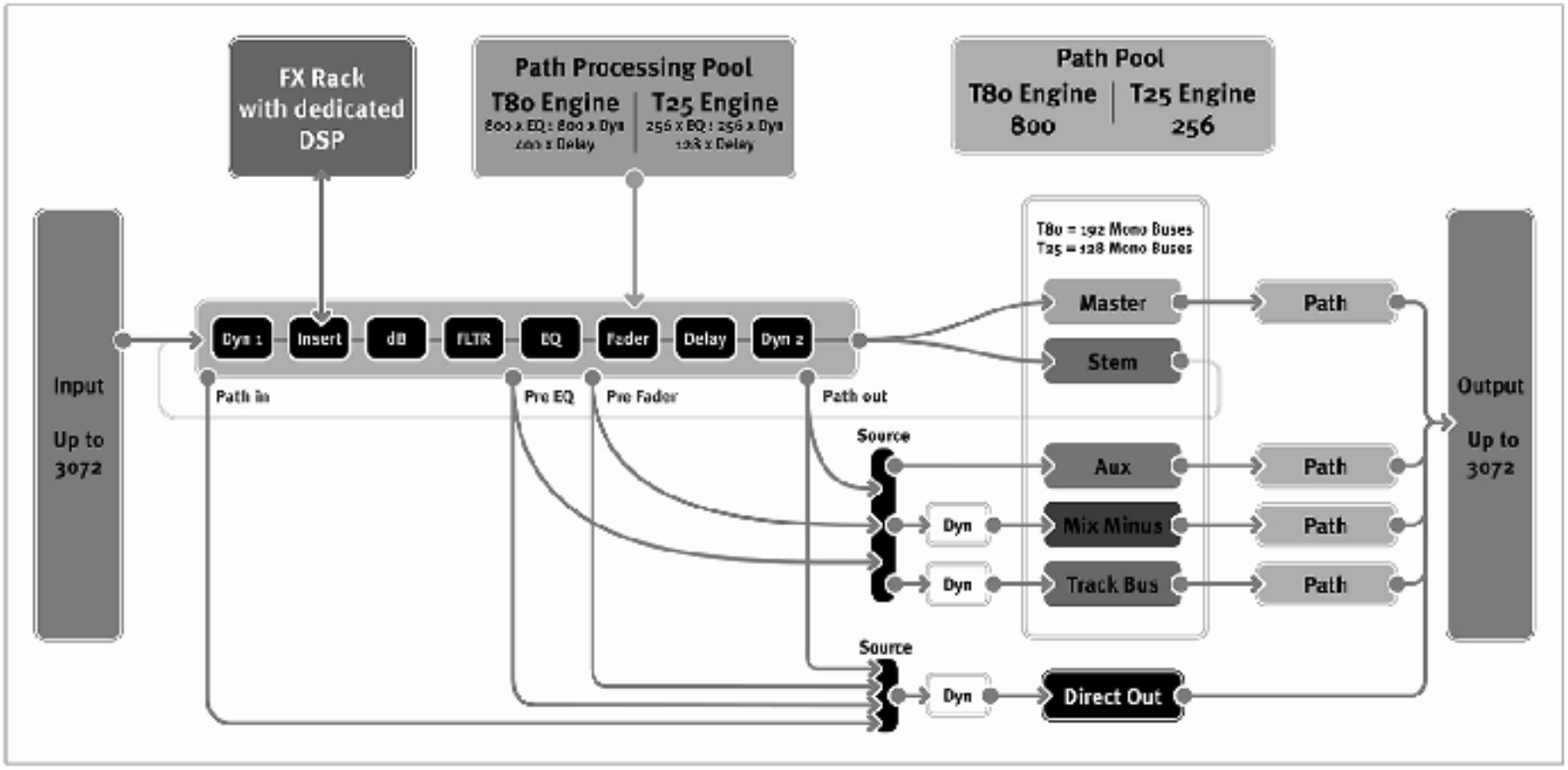
With System T, Dante AoIP network technology replaces traditional TDM routing with an ecosystem that offers a wide range of operational and commercial benefits. Dante is a licensed IP Audio Network technology which uses standard IT infrastructure for audio transport, routing, device discovery and control. Dante is high capacity, incredibly versatile and fully scalable. A single gigabit network connection can carry 512 audio channels at 48kHz, or 256 channels at 96kHz. With 512 audio channels bi-directionally on a 1GB connection, a single 24 Port GB Switch is capable of equivalent routing capacity to a 12,288 by 12,288 TDM router at a fraction of the cost. Expansion of a network is not subject to the square law growth required when expanding TDM routing systems; additional switches and capacity can be deployed without replacing core hardware.

Dante offers fully interoperable system design; over 225 licensed development partners with more than 350 devices commercially available enable you to select and combine devices from different manufacturers. The system includes full AES67 audio transport capability. Routing control can be achieved from an unlimited number of devices or network terminals. Dante employs full plug and play device discovery enabling devices to be moved around the network and re-connected with settings intact. Fully redundant network topologies widely used and proven in many IT applications provide the security required for Broadcast infrastructures.

SSL Network I/O interfaces bring renowned SSL audio performance to Dante networks. They can be used as standalone solutions or used with System T to complete powerful facility wide systems. Five different devices offer mic/ line analogue, MADI, AES and SDI embed/de-embed capability wherever it is required. System T Control Interfaces and SSL Dante Control Software offer remote control over SSL mic/line I/O across the network.

Processor Engine(s)

The Tempest processor engine deploys SSL's patented Optimal Core Processing (OCP) software using arrayed industrial PC hardware in a controlled operating environment. Tempest delivers proven reliability every day in arenas around the world with SSL Live consoles. Housed in a 4RU chassis a single engine can process up to 800 plus audio paths and support up to 192 mono summing busses.. Paths and processing can be dynamically allocated in real time without interrupting audio. With over 3000 inputs and over 3000 outputs per engine, System T can handle any large scale production. Tempest engines can be deployed as mirrored redundant pairs and if required each engine rack can be placed in separate fire zones. Near instant audio changeover happens via up to 6 Network I/O HC bridging cards, each providing 512 channels of inputs and 512 outputs.



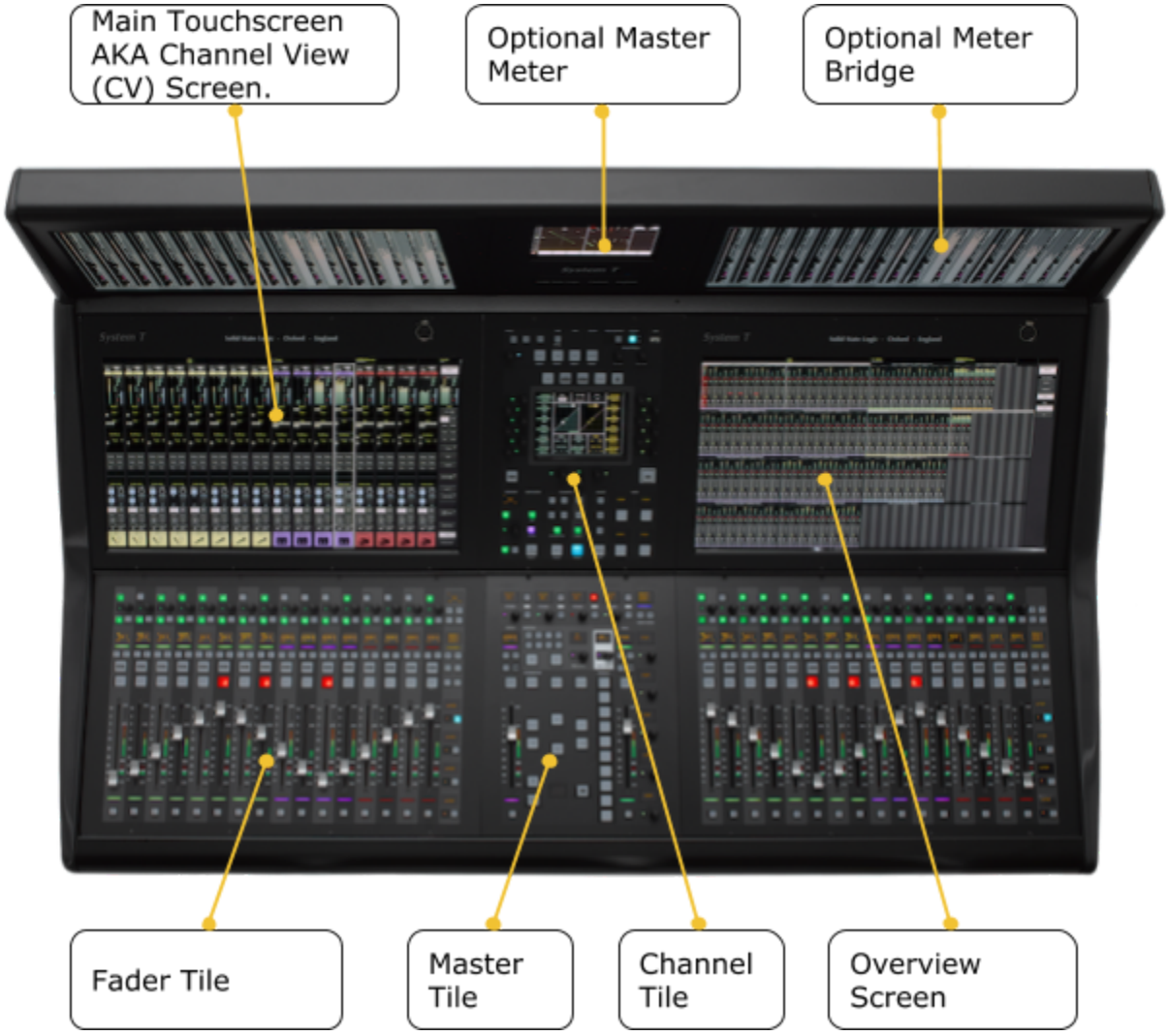
T80 and T25 Tempest Engines Capacity Outline & Structure

Surface Components - A typical console.

The picture below shows the typical components of a System T console (also referred to as the Front panel). Each Front panel can be custom configured, so this isn't always the layout. Most Front panels will have one, or more of each of these components.

Front panel Overview

The System T Front panel is made up of fader tiles, one control tile, one master tile and optional Meter Bridge screens/meters.



The **Main Screen** is a multi-touch display used to access audio parameters and setup functions.

Fader tiles are the primary physical interface for manipulating audio levels. A single 16 fader tile can address multiple unique faders. Faders can control mono, stereo, and multi-channel audio paths.
Quick controls at the top of each fader tile provide access to most path parameters (gain, processing, pan, auxes, bus assignment, etc.) Think of these controls as a full analog channel strip, yet ergonomically condensed within layers of soft keys. There are several other ways of controlling processing.

The **Channel Tile** provides an alternative way of accessing these same path parameters. Its small screen is also a multi-touch display. This allows you to work how you prefer--on the touchscreen, quick controls, and/or control tile. Additionally the control tile provided access to extended monitor functions, Console automation and additional system control.

The **Master Tile** contains the Focus fader, monitor level and source selection, automation, master fader and talkback.

As its name suggests, the optional **Meter Bridge** displays levels. These are in addition to the meters visible in the Overview Screen and next to the faders on the Fader Tiles.

The **Overview Screen** shows all the active signal paths in the console. This screen is interchangeable with the Channel Screen in the console at the press of a button.

Power (switching on and off!)

To **power on**, press the recessed POWER button in the top right corner of the Channel Tile.
The POWER button indicates the status of the main and backup power supplies:

- Off - AC mains is not connected or switched.
- Backlit white - AC is present, ready for power up.
- Green - on and functioning correctly.
- Green flashing - on, but power has been interrupted within the previous 20 seconds.
- Red flashing - off or there is a fault.

To **power off**, access the Setup menu's on-screen Power button, then hold the on screen 'Power Off Console'.

There is no full soft restart -- individual processes can be restarted within the **setup | system** menu.

Note: Shutdown removes consoles Dante routing
Dante Routing across the network is "owned" by the console that made the route, when a console is shutdown the Dante routes are now removed from the network (in the same way that loading a blank showfile would do). This frees up audio resources and ensures correct routes can be established across larger multiple console System T Dante networks.

Brightness Controls

Near the power button are two encoders for controlling brightness of the touchscreens, and surface displays:

- Turn to change the brightness.
- Press once to recall the stored brightness value.
- Press and Hold to store the current value for later recall.

GUI and Operation Principles

Some on-screen buttons have additional functions, or need longer presses to activate. These are indicated by the on-screen button having one of the following symbols in the top right hand corner of the button.

Press & Hold

A timer symbol indicates press-and-hold to activate. The hold time is adjustable in **Menu|Setup|Options|Console**.

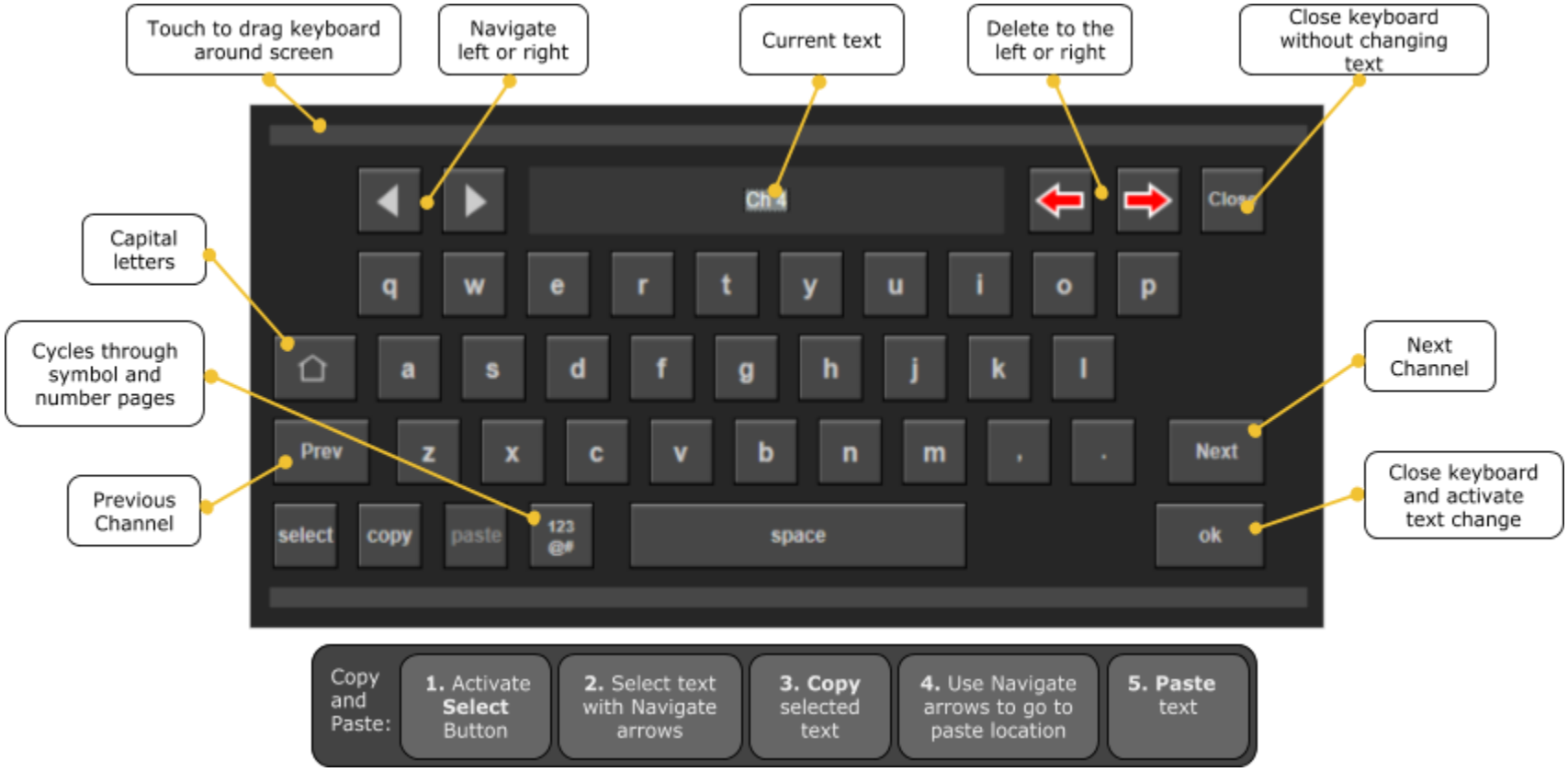
A timer & arrow indicates both a press function and a hold function. When you press-and-hold the button, a secondary menu appears.

A button with an arrow implies there are additional drop down menus/options when the button is selected.

A button with light grey text shows the function of the button, but that it is not available. E.g. EQ band reset, if the EQ is not 'IN'.

Keyboard

When a name or number needs to be entered a keyboard can be called up on screen by double-tapping a text or a numerical box on the touch screen display.



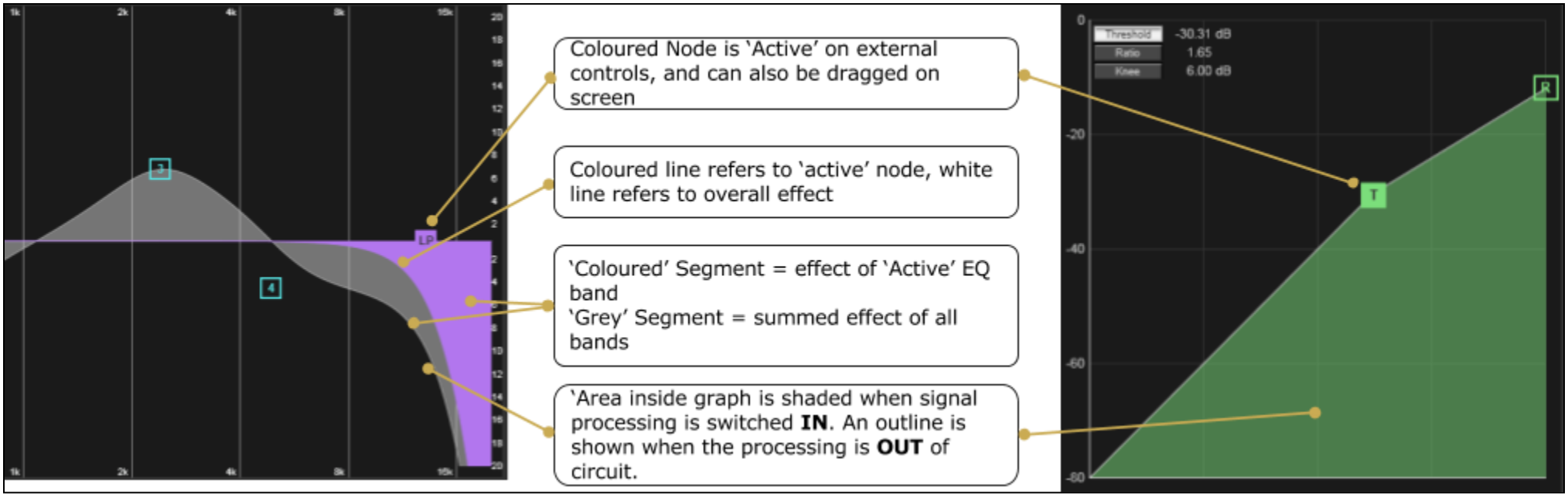
- ***You may attach a USB keyboard with number pad to one of the USB ports on the front panel for even faster typing access.***
- ***Double-tap the shift key to latch caps lock.***

Within channel or scene names, the **next** and **prev** buttons (tab and shift+tab respectively if using a USB keyboard) allow quick navigation through paths or scenes.

- ***Next and prev move through path configuration and overview order, not in the fader tile or channel view screen order.***

Signal Processing Graphs

Main screen EQ and dynamics graphs have the following display features:


Coloured Node is 'Active' on external controls, and can also be dragged on screen
Coloured line refers to 'active' node, white line refers to overall effect
'Coloured' Segment = effect of 'Active' EQ band
'Grey' Segment = summed effect of all bands
'Area inside graph is shaded when signal processing is switched IN. An outline is shown when the processing is OUT of circuit.
Threshold
-30.31 dB
Ratio
1.65
Knee
6.00 dB
T
R

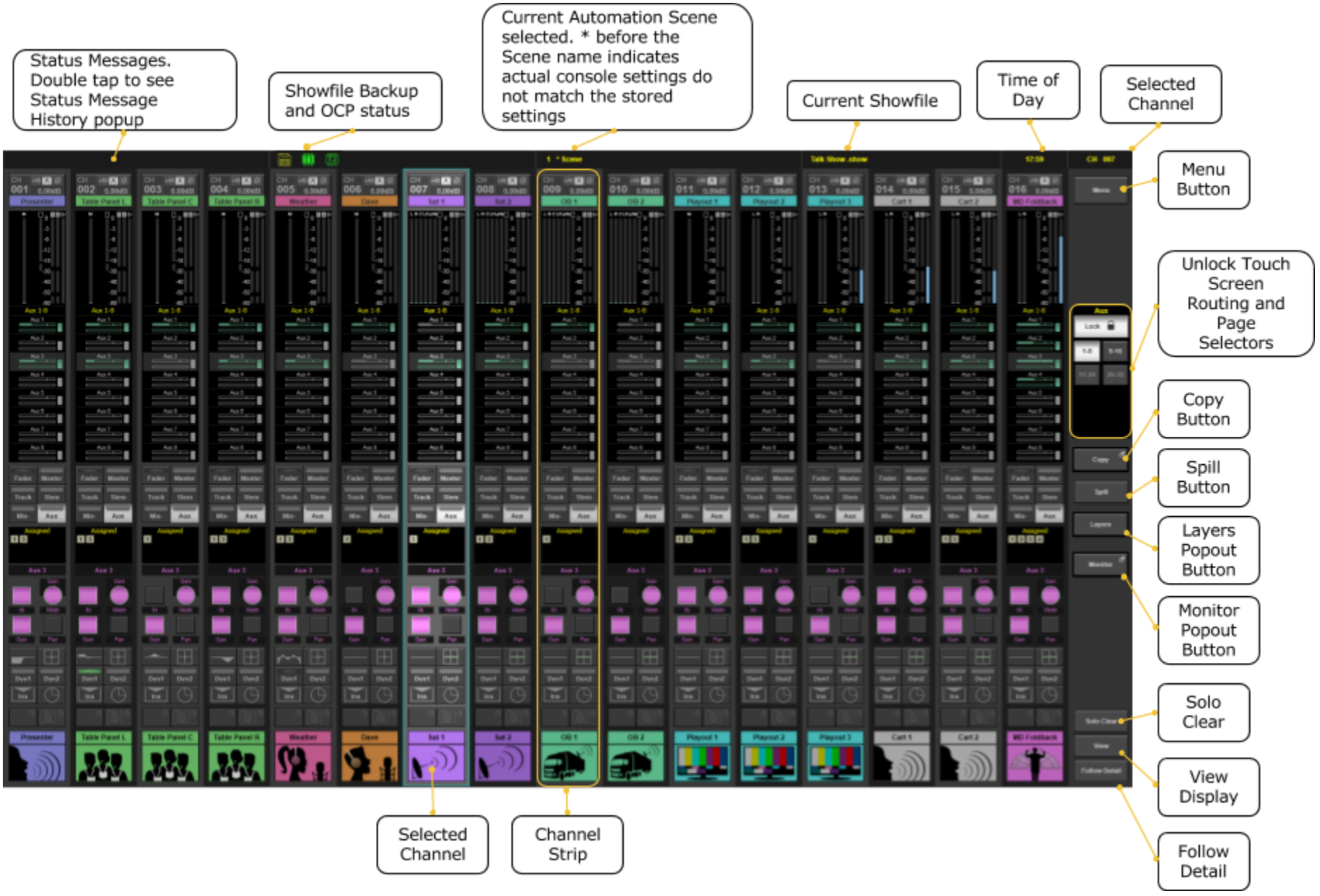
- ***'Selecting' a node allows a value to be entered via the text box and the band to be controlled by pointer touch screen and reset from the 'Detail View' band reset buttons***
- ***Double-tap the text box in the bottom right of the 'Detail View' to enter a specific value for the selected parameter.***
- ***The context encoder on the Channel tile above the Focus fader can be used to adjust the selected band. The switches are used to select parameters as shown in the associated OLED display.***

A full description of the '**Detail View**' is found later in this manual.

Touched encoder indication

Main Screen OverView

The Main Touch Screen is the primary System T control interface. The 16 Touch Screen Channels both display and are the primary access controls for all the console processing and routing. In normal use the on screen channels are directly linked with the associated physical controls on the fader strip directly below the screen.


Status Messages. Double tap to see Status Message History popup
Showfile Backup and OCP status
Current Automation Scene selected. * before the Scene name indicates actual console settings do not match the stored settings
Current Showfile
Time of Day
Selected Channel
Menu Button
Unlock Touch Screen Routing and Page Selectors
Copy Button
Spill Button
Layers Popout Button
Monitor Popout Button
Solo Clear
View Display
Follow Detail
Selected Channel
Channel Strip

Main Touchscreen Menu

The menu buttons on the rightmost column of the main screen allow for configuration.
There are two menu trees, the operational menus and the setup menus:

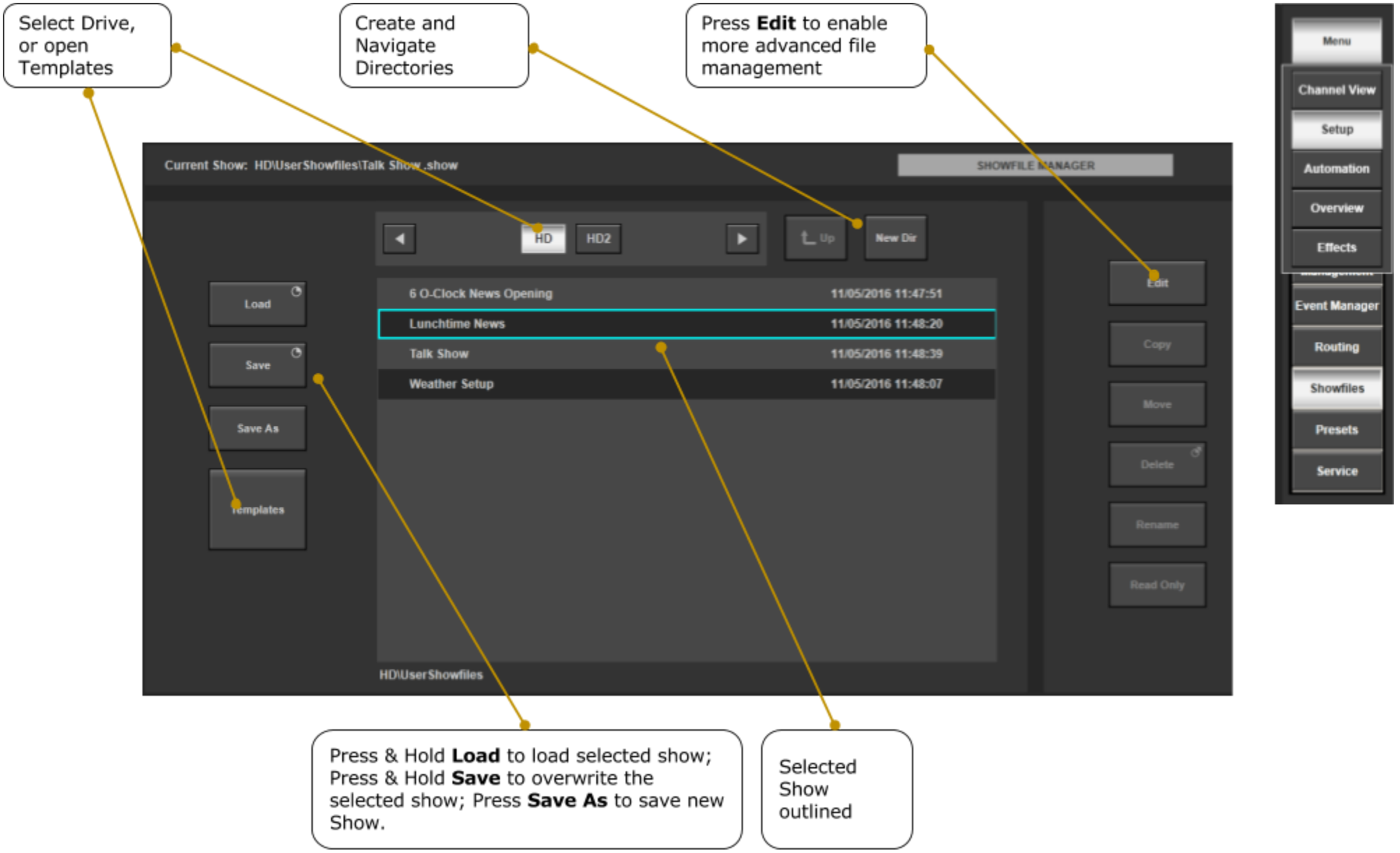
The **MENU** Button Expands the menu tree:

- **Channel View** - Displays the fader tile that is selected with the tile screen button. This is where you'll spend most of your time.
- **Setup** - opens the console setup configuration menus:
    - **Options** - accesses user preferences and clock sync settings.
    - **Console Configuration** - is where the DSP paths are allocated. This is where you might begin with a new console!
    - **Layer Manager** - is where your physical fader tile layout is defined. You would use this after console config.
    - **I/O** Setup shows the hardware I/O configuration and connected Network I/O devices.
    - **I/O** Management is where the physical audio connections and logical devices are defined and managed.
    - **Event Manager** - is where 'events' such as GPIO triggered functions are configured.
    - **Routing** - allows bulk routing of consecutive sources to consecutive destinations.
    - **Showfiles** - is where console setup files can be saved loaded and edited.
    - **Presets** - is for managing the console and user processing settings in one place.
    - **Service** - accesses maintenance and service functions. **Access is restricted to authorised personnel.**
    - **Surface Lock** - locks out the control to prevent unwanted operation.
    - **Power** - allows you to power off the console.
- **Automation** - is where scenes within the showfile are managed.
- **Overview** - shows all paths in the showfile at once. It's great for getting an idea how the showfile is configured at a glance. Many parameters can edited directly with a USB mouse!
- **Effects** - displays the rack of insert effects.

Loading and Saving 'Shows'

In System T the configuration of the console for a show is called a **'Showfile'.**

Showfiles are saved and loaded using the Showfiles menu, accessed by touching **Menu | Setup |Showfiles:**



Templates & Showfiles
Templates provide a starting point for a showfile. Touch the large **Templates** button to load templates. Templates are read-only.

To access existing saved Showfiles, ensure that **Templates** is inactive. At the top of the list, select the HD or USB drive.

- *USB drives should be used for file transfer (copy) only. Do not load or save to USB. Please copy to and from USB before loading and saving.*
- *USB drives may be physically removed after disk progress in the upper left of the main screen has disappeared.*

Swipe the screen to scroll the drive contents list.

Directories (Folders) appear at the top of the list. Double-tap folders to open them, and touch **Up** to move up a level.

Touch a showfile to select it.

When a showfile is selected there are three options:
- Press-and-hold **load** to load the selected show.
- Press-and-hold **save** to overwrite the file. This showfile will become the loaded show.
- Press **Save As** to create a new showfile. This showfile will become the loaded show.

- *Save overwrites the selected showfile, not the showfile that is loaded on the console. The currently loaded showfile is always displayed in the menu bar at the top of the Channel View screen. To create a new show, load the show which you wish to use as a starting point and use the **Save As** function.*

Edit Mode
A number of folder actions are only available when the Show list is in Edit mode. To activate Edit mode, touch the Edit button in the top-centre of the screen. The button will 'light' and a second navigation pane will appear in the right side of the screen.

To select a Show to be edited using any of the edit actions listed between the panes, navigate to it in the left navigation pane and touch the circle at the end of its list entry – the circle will go red to indicate that the Show is Edit Enabled.

You can select multiple Shows and multiple folders for edit. You can also select all Shows and folders in the current location by touching the All circle at the top of the list.

Remember: Edit mode functions always act on the Shows which are Edit Enabled, and not on Shows which are highlighted (displayed with a cyan surround).

Moving and Copying Shows

To move or copy files and folders, navigate to the source folder in the left pane, and the destination folder in the right navigation pane;
In the left navigation pane, Edit Enable the items to be moved or copied; Now press the Move or Copy button in between the two panes. The items will be moved or copied to the new location.
Notes: The currently loaded Show cannot be moved. Items cannot be copied into their current location.
Making Shows Read-Only

You can make Shows read-only in order to prevent them from being overwritten via the Save function. To select the Shows to be made Read-Only, navigate to them in the left navigation pane and Edit Enable them. Now press the Read Only button in between the two panes. A padlock symbol will appear before the file names.
To undo a file's Read Only status, simply repeat this procedure.

Renaming Shows and Folders

To rename a file or folder, navigate to it in the left navigation pane and Edit Enable it.
Now press the Rename button between the panes, rename the Show using the keyboard which appears, and touch OK.

Deleting Shows and Folders

To delete Shows or folders, navigate to them in the left navigation pane and Edit Enable them. Now press-and-hold the Delete button between the panes.
Note: Folders must be empty before they can be deleted. Showfiles with Read Only protection cannot be deleted.

Backup Showfiles

The console saves a backup showfile with the state of the console every minute, so this is the most you will lose in the event of a power loss. When restarting the console it will always load the most recent backup showfile for you, so it's ready to go.

Note: If the last showfile loaded or saved was to a USB drive, the backup showfile will not be loaded when restarting the console. This is a security feature to prevent visiting engineers' showfile data from persisting in the system.

Status Bar Indication

The name of the currently loaded Show is displayed at the very top of the screen, towards the right-middle of the status bar. One of the following icons will be displayed to the left-middle of the status bar:

The Current Show is saved to the user's showfile and no pending changes to any part of the Show are detected by the system.

Part of the Current Show has changed since last user Showfile save and the changes are saved on the console's backup system.

Part of the Current Show has changed since last user Showfile save and the changes are not yet saved on the console's backup system.

The system is currently saving or loading Show data, either to/from user file, or from the console's backup system.

Showfile Compatibility

Showfiles created on a larger Tempest Engines or at lower sample rates with higher processing resources may be loaded onto a smaller one (e.g. T80 onto a T25). The system will automatically enter 'Compatibility' mode if the showfile cannot fit within the resources available. This allows paths and effects to be disabled (from the Console Configuration and Effects Rack pages respectively) to allow the show to fit on the smaller processing engine.

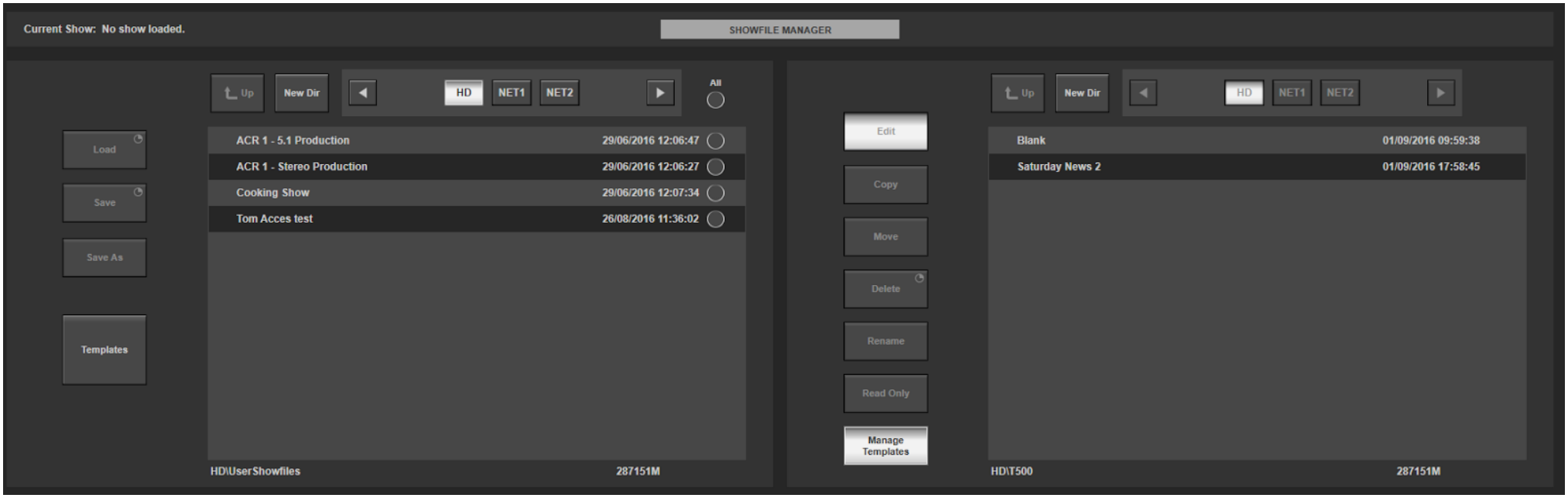
Compatibility mode may also be enabled manually by engaging the Compatibility Mode button in **Setup, Options, System.** Manually choosing compatibility mode allows you to save in a showfile the processing that will be disabled when loaded on a smaller set of resources.

An icon will be displayed in the status bar at the top of the main screen to indicate that Compatibility mode has been enabled. Red shows compatibility mode is engaged and some processing is disabled, green shows compatibility mode is engaged but no processing is currently disabled.

In compatibility mode you can choose which paths to disable, in **Setup, Console Configuration**, engage the Compatibility button on the right hand side of the screen. Expand the desired path type list and tap the radio button in the Enabled column for each path you wish to disable. Press & hold the Apply button to confirm the changes. Disabled paths will remain on the control surface but will no longer pass audio when loaded on a smaller capacity engine or sample rate.

User Manageable Showfile Templates

Custom show files can now be added to the templates folder. The templates folder is show file storage that can be write restricted using access control. This allows the SSL commissioning engineer or senior broadcast engineers to build show files that include specific routing and a complete setup based on the infrastructure specific to a facility. When new show files need to be built these templates provide a known starting point that is custom designed for a specific installation. The templates folder could also be used to store preconfigured show files for local operators to use.



Access Control Levels

Access Control allows a granular approach to user levels. By default there are 2 user levels that cannot be deleted (Admin, Default) and 2 examples of other access levels (Senior Operator, Operator) that can be deleted and renamed. Only an admin level user is allowed to change the features available to any other access level, features can be enabled or disabled by touching the blue or grey radio buttons when in admin level. Blue indicates that the feature is available to that user access level. Changing access level is via the large button in the "Active" row of the table.

On installation there will be 4 access levels:

Admin - Cannot be deleted, cannot be renamed, can be given a password, always has all features enabled. To edit any other level Admin needs to be the active level

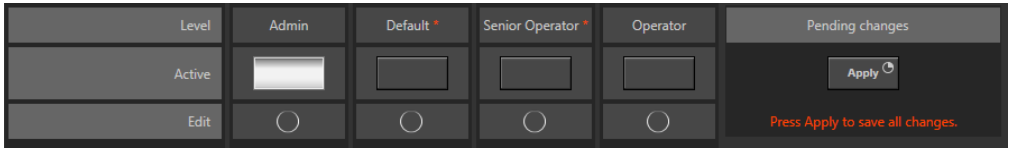
Default - Cannot be deleted, cannot be renamed, cannot be given a password (therefore restrict all features for default level if you want to prevent malicious rather than accidental access to certain features)

Senior Operator - Can be deleted, has a default password of "SO" on installation but this can be changed by the admin user

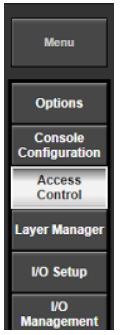
Operator - Can be deleted, has a default password of "O" on installation but this can be changed by the admin user

Up to 12 user levels can be configured, these are shared across all of the remote consoles or instances of T-SOLSA connected to the main console.

When in Admin mode the row of "edit" radio buttons (red when selected) allows you to change the name, password and of the selected level or levels. These settings can be altered using the buttons avaliable in the sidebar. The sidebar also includes a "new" button to make additional access levels.



Selecting the Active button in any column will put the console into that level of access control. Changing access level will also apply any changes made while in Admin mode. If changes have been made that you do not want to apply you can use the "undo" button in the sidebar to undo the pending changes.



Console Configuration, Channels and Paths

The Console Configuration menu allows System T to be completely re-structured per showfile. A pool of DSP paths are used as the building blocks for designing your showfile.

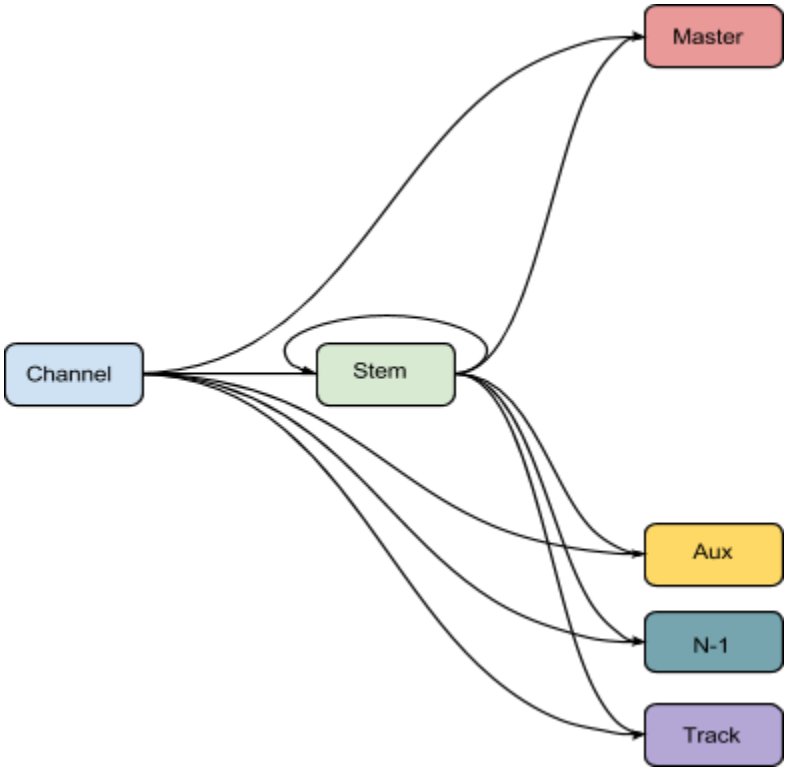
A path can be a Channel, Master, Stem, Aux, Mix Minus (N-1) or Track.

The way in which path types are used can be freely structured, but in the beginning you may want to think of the following workflow:

- Channels are the input sources.
- Masters are the main program mix buses.
- Stems are intermediate audio sub groups.
- Auxes are submixes for external destinations, IFBs, Intercoms, Studio Floor monitors etc.
- Mix Minus (N-1) are the dedicated mix minus buses for Remotes, Satellite feeds etc.
- Track are dedicated routing buses for external recorders, etc

Some audio paths are independent of the main pool - in other words, you get these for free! These are talkback, AFL and PFL paths. Non-audio paths (e.g. VCA's) also do not count against the audio path pool.

Procedures for modifying the console configuration are described in the Console Configuration section.



The simple diagram to the right summarizes path structure and signal flow:

- ***Notice that stems are unique in that they can be re-routed to other stems. This allows for extensive audio sub grouping. The console bus routing automatically prevents rerouting a stem back on itself.***

This table summarizes the distinctions between path types:

	Path type	**Source Options**	**Send Level Control**	**Send, bus, or output options**
Pooled paths	Channel	Physical inputs, Routable sources	Channel Fader	Stems, Auxes, Mix Minus, Track, Masters, Physical outputs, Routable destinations
	Master	Channels, Stems.	Channel Fader	Physical outputs, Routable destinations
	Stem	Other Stems, Channels.	Channel Fader	Other Stems, Auxes, Mix Minus, Track, Masters, Physical outputs, Routable destinations
	Aux	Channels, Stems	Per bus	Physical outputs, Routable destinations
	Mix Minus	Channels, Stems.	Single for all assigned Mix Minus buses.	Physical outputs, Routable destinations
	Track	Channels, Stems	Single for all assigned Track buses.	Physical outputs, Routable destinations
Dedicated paths	Talkback	Physical inputs, Routable sources		Channel and Stem Direct Outputs. Auxes, Mix Minus, Track, and Master Outputs.
	Tone	Physical inputs, Routable sources		Channel and Stem Direct Outputs. Auxes, Mix Minus, Track, and Master Outputs.
	AFL/PFL	Various console signals		Monitoring Routable destinations

Routable source & destination refers to any signal that is routed using the routing menus rather than operator send or bus-type controls. Routable items include both physical IO and console virtual IO (the effects rack, post fader paths, for example).

Console Configuration

System T's processing configurability allows it to be completely restructured for each show. At any time, additional Path types can be added without interruption to audio currently being processed by the console. System T has a pool of 800 mono DSP Paths which are used as the building blocks from which the console configuration is built – each Path can be turned into an Input Channel, a Stem Channel, or an Output Channel for the Master, Aux, Mix Minus and Track buses. Stereo or Surround Channels and Outputs are created by 'binding' up to six Paths together, depending on the required format.

In addition to channels, masters, stems, auxes, mix minus and Tracks there are a few other types of signal path which are independent of the main path pool. These are Talkback, Tone, AFL and PFL buses, and the Studio monitoring outputs.

The currently loaded Showfile configuration may well provide a suitable mix of channels and outputs. You can, however, edit the number of each channel type in the Console Config page: **menu/setup/showfiles:**

This is where the available digital signal processing is allocated to the different channel path types. The required quantity of the different channel path formats can be set here, as can the default point in channels and stems which is used to source each Auxiliary bus. Channels Paths can also be named in this display.

The main part of the Console Configuration screen is made up of a table displaying the number of formated channels within each Path type, and the total number of formatted paths used for a given path type.

The System Resources area at the very top of the screen indicate how much console DSP has been used. Three horizontal bars display the total number of mono Paths used, the number of mono Bus Paths used , and the number of mono bus paths used for for Stem Paths – if any of these are too close to their limit, you may want to reconfigure your session to free up processing.

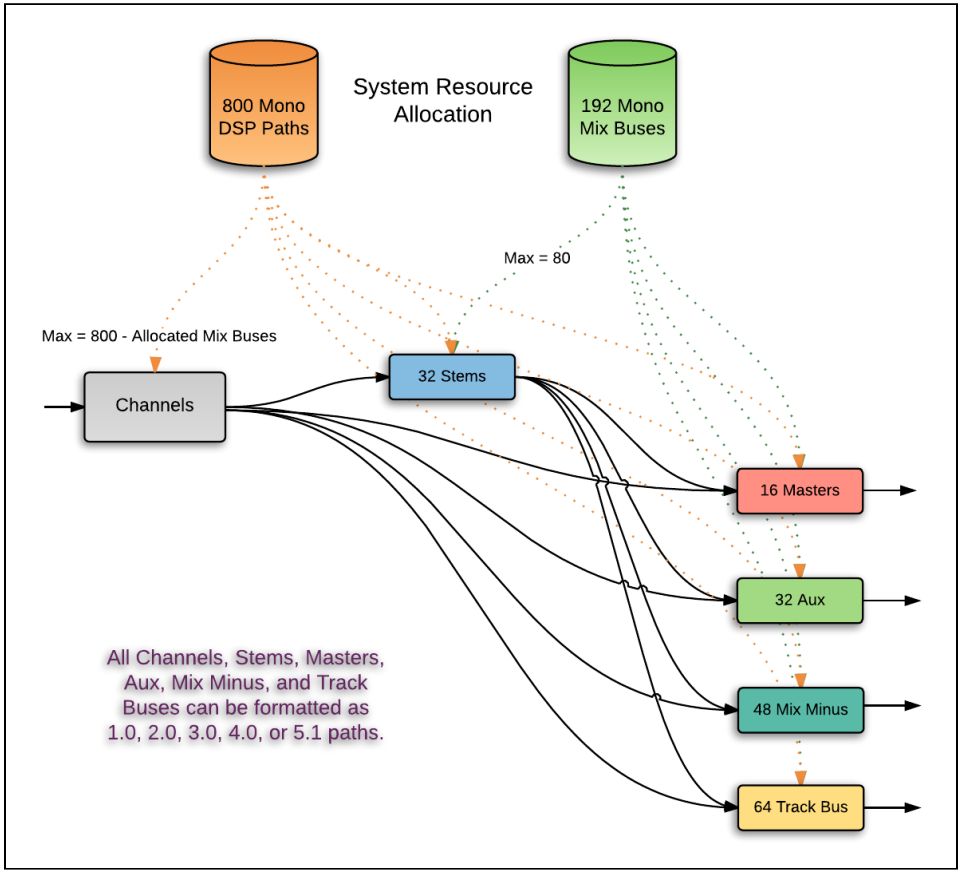
Before making any changes to the Configuration, press-and-hold the Refresh button (top left corner). This ensures that the console configuration is up to date before starting to modify the configuration.

Input, Aux, Stem, Mix Minus, Track and Master channels can be in mono, stereo, LCR, 4.0, or 5.1 formats, and the numbers of each format and type are shown in columns. Each mono channel uses one Path from the resource pool. Stereo channels will use two Paths, LCR channels use three Paths and so on.

To the right of each row is a horizontal bar display indicating the total number of formated Paths used and the maximum number of Formated Paths available for each channel path type. An overview is shown in the diagram below:

Bus & Path Counts

At 48KHz Fs*, System T has a pool of 800 paths for signal processing and mixing resouce of 192 mono summing buses. The allows large and powerful console configurations to be realised and a very powerful features of System T's processing is that these can be re-structured without having to re-start the console. This means shows can be built quickly and efficiently. Powerful showfile and preset tools can also be used to create quickly loaded presets for repeat shows. (*see 96kHz operation)


800 Mono DSP Paths
System Resource Allocation
192 Mono Mix Buses
Max = 80
Max = 800 - Allocated Mix Buses
Channels
32 Stems
16 Masters
32 Aux
48 Mix Minus
64 Track Bus
All Channels, Stems, Masters, Aux, Mix Minus, and Track Buses can be formatted as 1.0, 2.0, 3.0, 4.0, or 5.1 paths.

The following table defines the limits within which this flexibility can be realised.

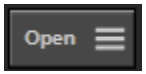
Masters	Max 16 formatted Master Busses
Stems	Max 32 formatted Stem Buses
Aux	Max 32 formatted Aux Buses
Track	Max 64 formatted Track Buses
Mix Minus	Max 48 formatted Mix Minus Buses
Channels	800 - The number of Mix buses used (Minimum is 608 mono channels)
AFL/PFL	2 AFL and 2 PFL Buses. AFL1 stereo or 5.1, others are all stereo.

Buses marked in the table above as "formatted" can be any format up to 5.1. The AFL/PFL bus details can be found in the Monitoring Section.

Changing The Console Configuration

To make changes to the Configuration, touch the **Edit** button to the right of the page – it will light to indicate that the page is editable.

- All numbers which are editable will no longer be greyed out.
- To change a number, double-tap it, edit the number using the keypad which appears, and press OK.
- If you leave the box blank, or put non-numeric characters in it, it will gain a red surround - you will need to correct this before continuing.

Bus configurations can be expanded/edited by selecting the 

button on the right hand side of the Path strip.

Auxiliaries can be fed from a number of different 'feed points' within the channel or Stem processing path. Each aux bus can have a default feed point and also a per-channel feed point that can override this default.

The default feed points for each bus can be set from the following options:

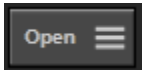
- **Pre EQ**, **Pre Fader,** or **Post All** processing (including the fader)

Aux rows can be expanded to show the three feed point options separately by using the

right arrow in the Aux View column. The numbers in the expanded display can be edited in the normal way. Touch the View down arrow to fold the type row away again. The feed points for each Stem are shown in the expanded list view (see below).

- ***If channels are added with the source points collapsed together without specifying a feed point, Auxes will be created Post Fader.***

The channels are assigned numbers in the same order in which they are added using the mono, stereo, LCR , 4.0 and 5.1 numeric text boxes. However, it is also possible to edit and add new channels of each type one-by-one.

To do this, click the list symbol in the View column. (For Auxiliaries and Masters, this symbol is only visible 

when they are in expanded view.)

Each channel within the relevant type will be displayed in its own row, with a green 'light' indicating the current format. Touch the indicator for the required format on each channel, so that it goes green.

The bottom row of each expanded list also allows you to add a new channel of that type in the chosen format to the end of the list.

Editing Channel Names

Still in the expanded channel view mode with the **Edit** button active, double-tap the name text to open an on-screen keyboard. Type the new channel name and press **OK**.

Touch the list symbol again to fold the channels back into their channel type row.

Delete, Move And Copy

You can delete, move or copy channels in the display:

Still in the expanded channel view mode with the **Edit** button active, touch the grey radio button in the Edit column (to the right of the format columns) for the channel(s) in question – it will go red for each channel selected to indicate it is being edited.

Multiple channels can be marked for edit at the same time.

- To delete the channels, now press-and-hold the **Delete** button.
- To move channels, press **Move** then touch channel after which you want the moved channels to appear.
- To copy channels, press **Copy** then touch channel after which you want the copied channels to appear.

The copied channel's name will consist of dashes – rename it in the usual way.

The channel ID column will be refreshed once the **Apply** function has been activated (see below).

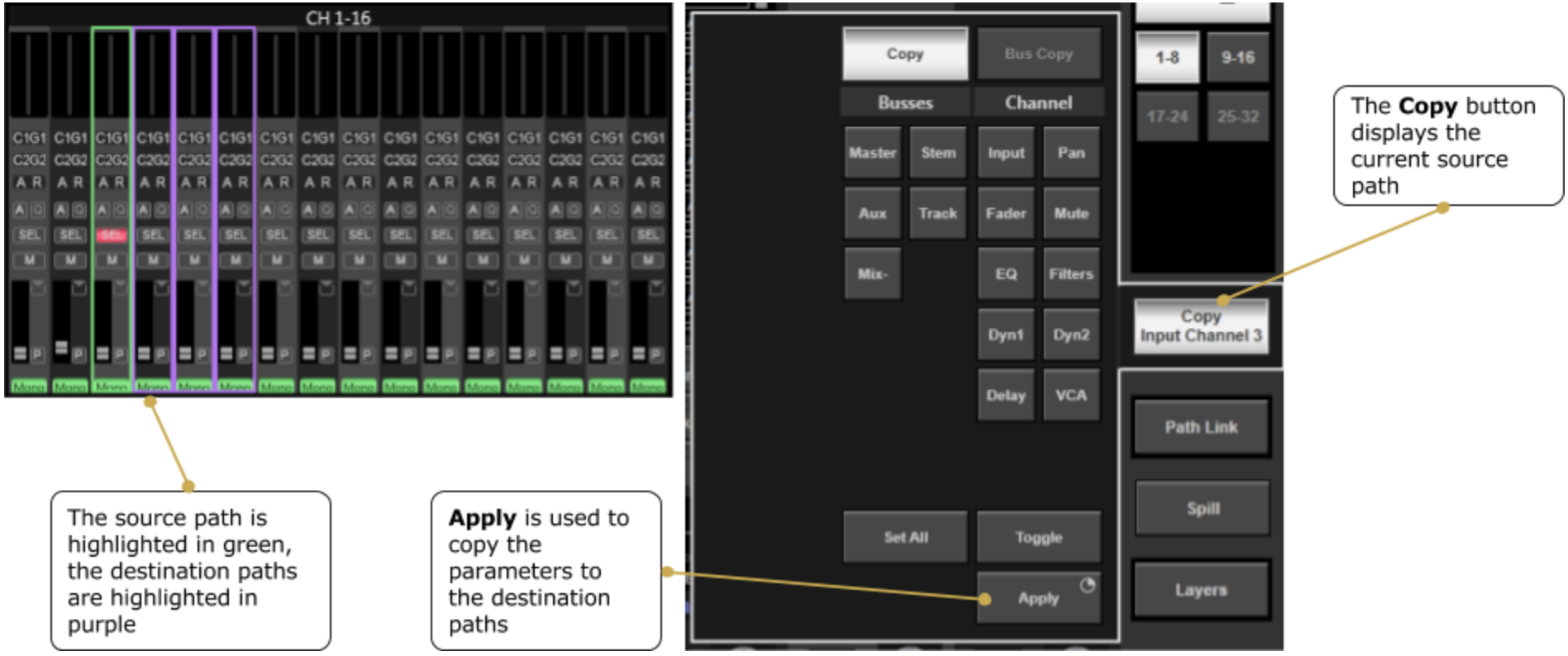
- ***These actions will apply to all channels selected for Edit in the most recently selected channel type section (Channels, Stems, etc. section highlighted by a coloured border), regardless of its expanded view state or the channel's visibility at the time of edit.***

When you have finished making changes to the Console Configuration page, press-and-hold the **Apply** button (top right) to make the changes active on the console. Then use the Layer Manager to assign the channels and outputs to the console's control surface.

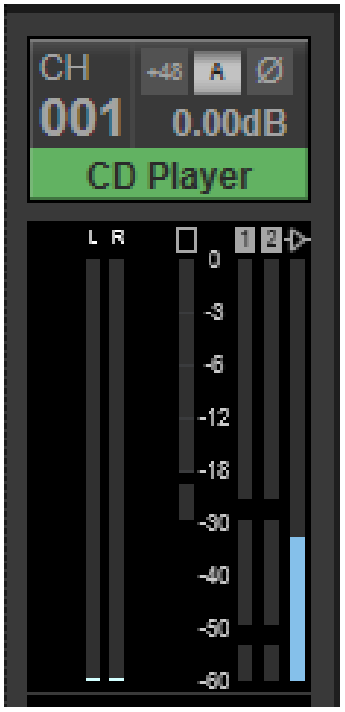
Copying using the Select key

Copy can be used with the physical tile **select** keys in addition to the on screen selection in the channel view. An apply button is used to complete the copy process.

Individual bus routing and path parameters can be copied from the source to the destination using the copy modifier keys. **Set all** and **Toggle** allow quick changes to the parameters being copied. When copying between busses, **Bus copy** allows the contributions (from channels or stems) to be copied between busses.



Channel Name routed source options



For channel paths, the channel name shown has a set of hierarchical options. These name options apply to the name shown in the channel view (top of the meter and Eyeconix display), the OLED display on the fader tile, the Meter Bridge (where fitted), the channel name in the small screen display and the channel name shown in console configuration.

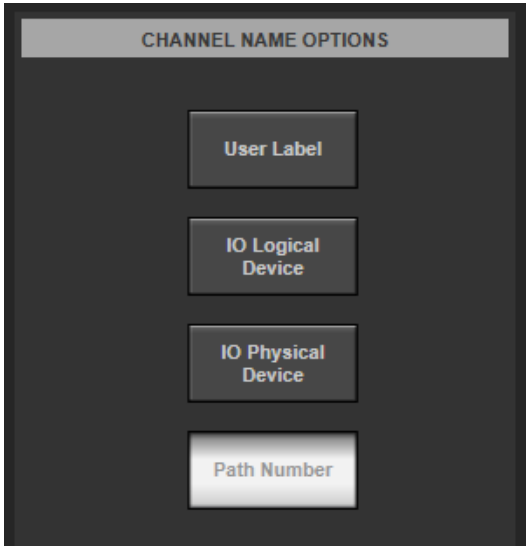
The option (from lowest priority to highest) are:

Path Number - The processing path number as determined by the order of the channels in console config

IO Physical device - The Dante Device Name and Input Channel Number. E.g. "SB 7 Input 3"- Typically for use if an engineer wants to track down the physical device routed to a channel path, if a channel is formatted spilling this channel shows the physical ports on the IO device

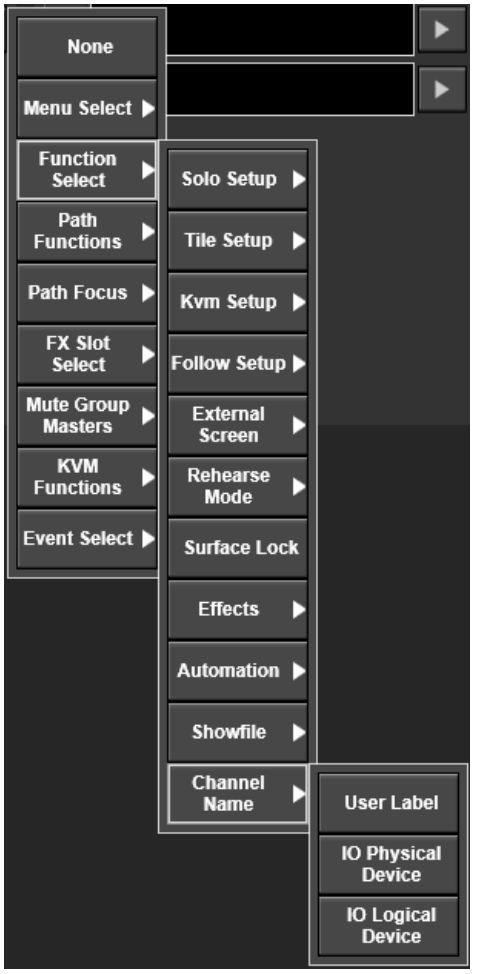
IO Logical device - The System T Logical Device name that will have been configured in the IO management pages during commissioning. E.g. "CD Player"

User Label - The per path user label entered in the channel detail view of the console configuration page, this would typically be a temporary label for use within a specific showfile E.g. "Guest Mic 1"



Each of these options can be selected in the **setup**/**options** path GUI or the buttons selecting these options can be assigned to user keys for quickly swapping the name shown on the surface.

Note: In the channel name options "path number" can not be unselected

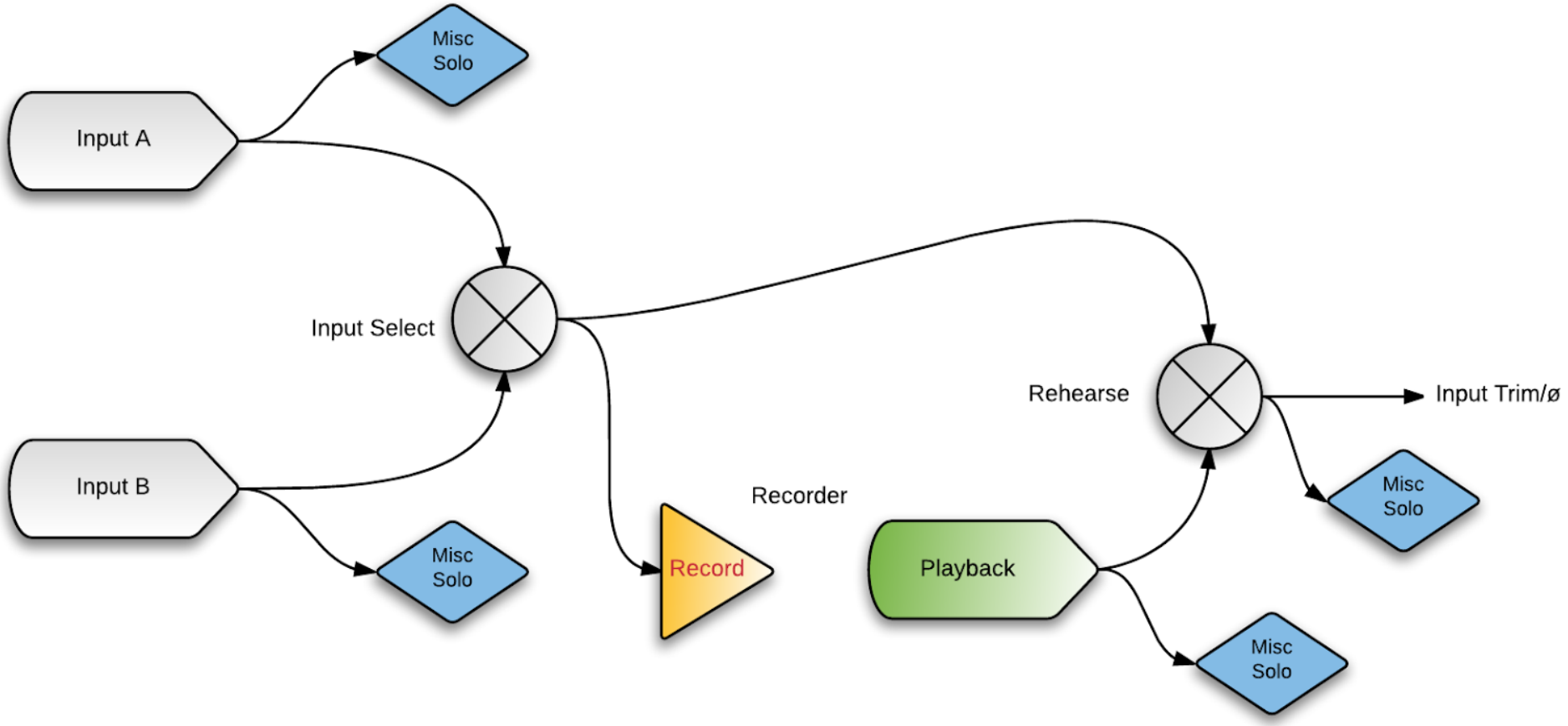


Rehearsal Recorder routing and set-up

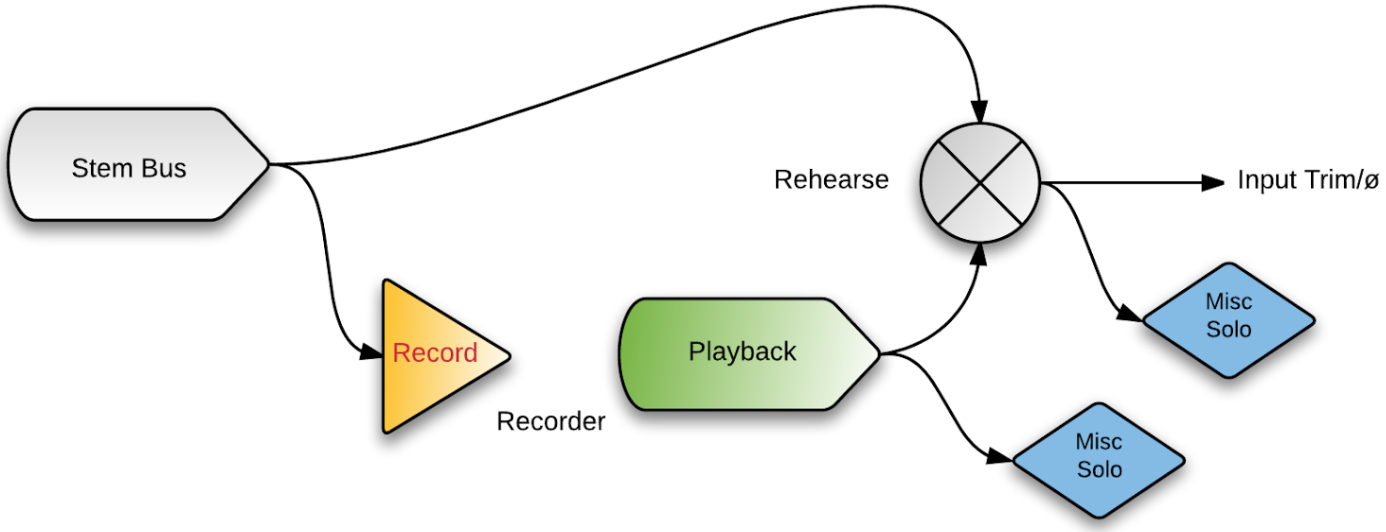
Local or global rehearse switching (channels and stems)

All channel and stem paths have a recorder send and a return point for playback or rehearsal mode. The channel and stem record send and record return points are routable points available in all the routing GUIs. Their location in the signal path is shown in the two diagrams below.

Channel Path Recorder Routing

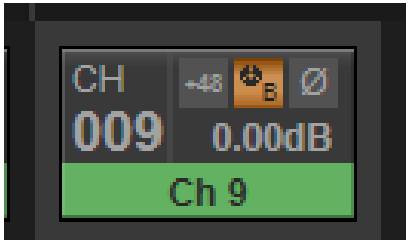


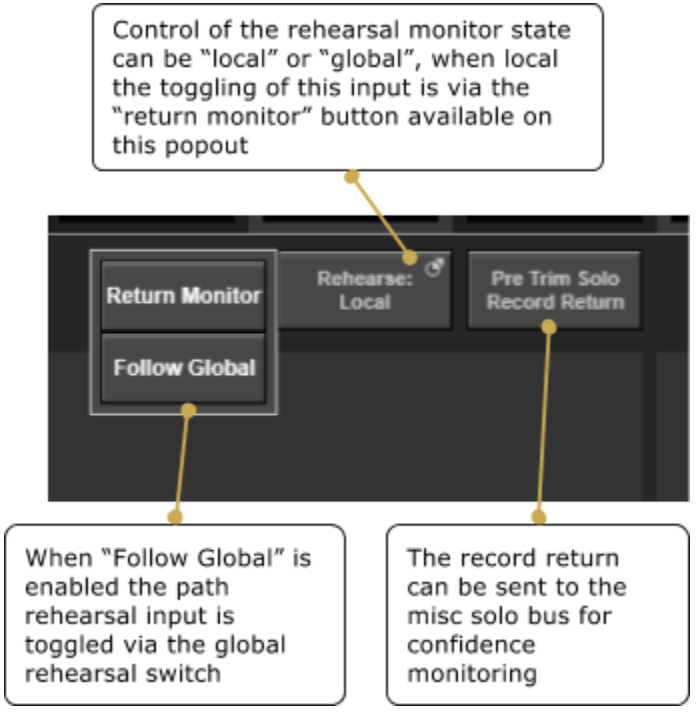
Stem Path Recorder Routing



Global Rehearse Mode can be toggled in the **Setup**/**Options, Path** tab, this can also be assigned to user keys or external GPI via Events manager.

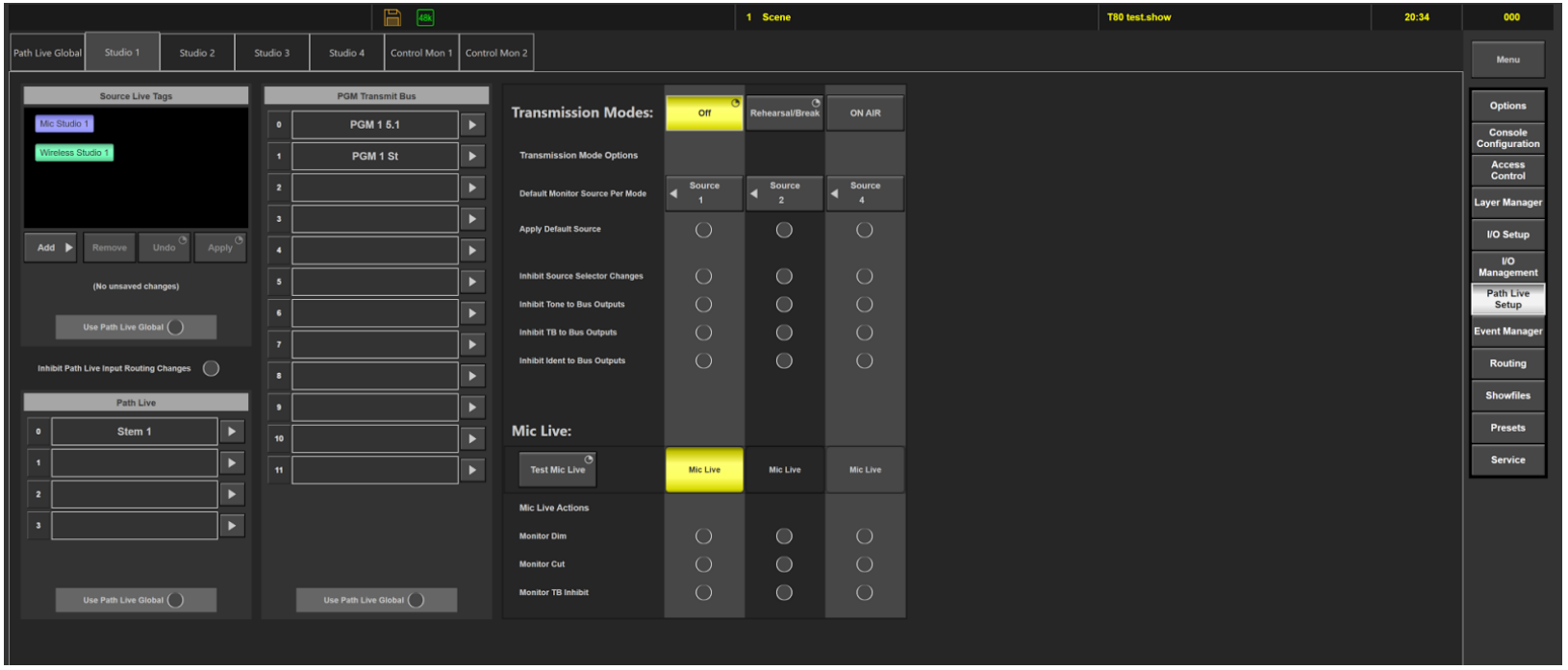
When a path record return is active this is shown with a orange tape symbol at the top of the channel strip.




Control of the rehearsal monitor state can be "local" or "global", when local the toggling of this input is via the "return monitor" button available on this popout
Return Monitor
Rehearse: Local
Pre Trim Solo Record Return
Follow Global
When "Follow Global" is enabled the path rehearsal input is toggled via the global rehearsal switch
The record return can be sent to the misc solo bus for confidence monitoring

Path Live and Transmission Mode

The Path live setup page configures the console's three **Transmission Mode** states, sets the input sources and busses that activate the "On Air" logic and what functions are activated or disabled in the control room monitor outputs and the 4 studio monitor outputs for each transmission mode and by the path live logic. By defining source live tags, Path Live Triggers and PGM Transmit Busses "Mic Live" states can be determined automatically. A set of global settings can be used to simplify configuration and/or to drive individual channel and bus tally indications for those paths that are live. These configurations are stored within the showfile allowing complete flexibility across consoles networked across multiple control rooms and studio floors. Path Live uses the concept of logical device tags to define sources that contribute to the path live logic, therefore IO management and the idea of defining logical devices with tags is a prerequisite for using path live. Many Path Live functions also can be used in the events manager, this allows even more comprehensive macro programming based on path live states. The features can be accessed in the **Setup, Path Live Setup** menu. The tabs access the parameters for each path live setup; **Path Live Global, Studio 1, Studio 2, Studio 3 Studio 4, Control Mon 1** and **Control Mon 2**. Transmission modes can be completely independent but changing the **Transmission Mode** in the global tab changes the transmission state of the individual subsystems. For show files configured for a single production studio it is recommended that the global settings be configured with studio 1 set to use the path live global parameters, for more complex multi studio productions each individual system may need to be configured. Across a fully networked multi studio facility path live provides the level of flexibility required to handle complex configurations.



For each Path Live setup, a path is considered to be live if the following is satisfied:

- Any valid source (with a designated **source live tag**) is routed to the currently active channel input
- This same channel path is "On" (not muted and both channel faders open, main and 2nd fader)
- VCA's assigned to the channel, master or stem paths are not muted and open
- This same channel is routed to designated **PGM Transmit Bus**(ses) and at least one of these busses is "On" (not muted and both faders open)
- If routed to designated PGM Bus(ses) via a Stem(s) or nested Stems, the Stem path in that signal flow also needs to be "On" (not muted and both faders open)

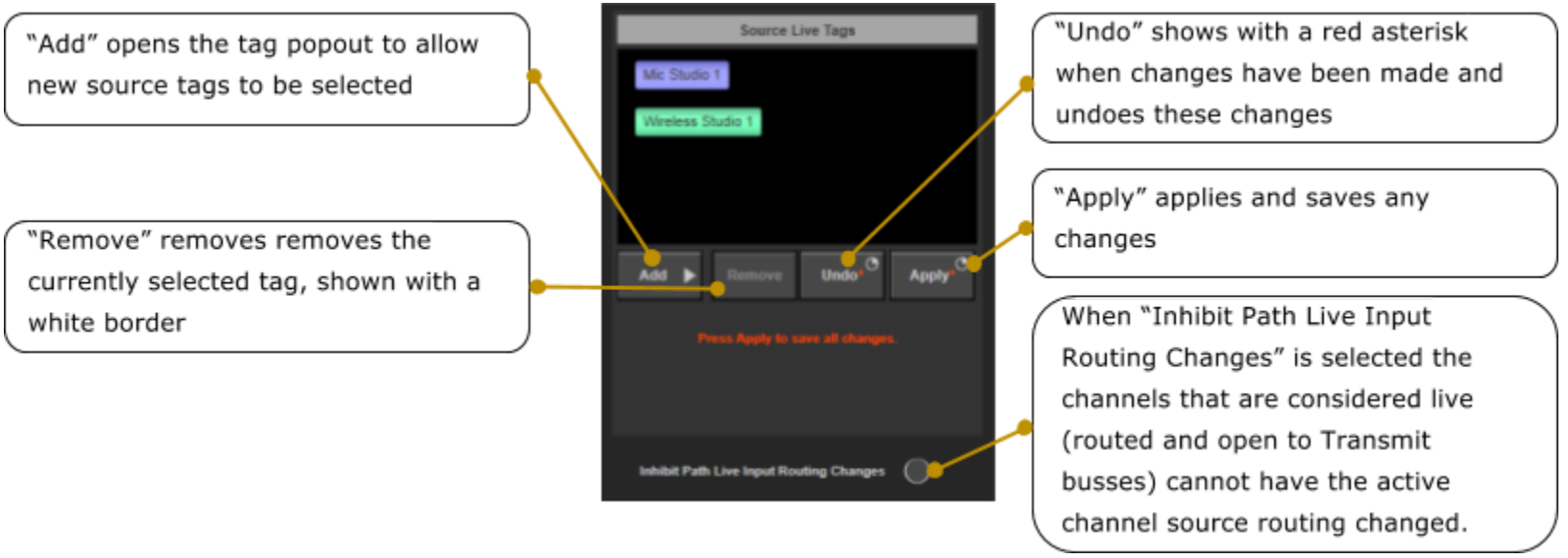
OR

- A **Trigger Path Live** is "On" (not muted and both faders open)
- This trigger path is routed to designated PGM Transmit Bus(ses) or and at least one of these busses is "On" (not muted and both faders open)
- VCA's assigned to the channel, master or stem paths are not muted and open
- If routed to designated **PGM Transmit Bus**(ses) or via a Stem(s) or nested Stems, the Stem path in that signal flow also needs to be "On" (not muted and both faders open)

The path live state can also used to prevent changes to the channel path input routing. So the Mic (or other signal) cannot be replaced or unrouted while on air. Input A, B and record return switching can still happen but input routing to a path that is path live is disabled if the inhibit option is selected.

Source Live Tags

Source Live Tags allow you to determine the audio sources that are used to trigger the path live system. Multiple (unlimited) tags can be added, these can be either top level tags (purple) or general tags (green). The inputs involved in the path live system are those covered by any of these tags, rather than those covered by all of these tags. Any path with a tagged source routed to the path's active input (A or B, not the record return) will have its path live state drive the path live logic. Typically these source tags will represent microphones in the studio but could be used for any audio source if required.


"Add" opens the tag popout to allow new source tags to be selected
"Remove" removes removes the currently selected tag, shown with a white border
Source Live Tags
Mic Studio 1
Wireless Studio 1
Add
Remove
Undo*
Apply*
Press Apply to save all changes.
Inhibit Path Live Input Routing Changes
"Undo" shows with a red asterisk when changes have been made and undoes these changes
"Apply" applies and saves any changes
When "Inhibit Path Live Input Routing Changes" is selected the channels that are considered live (routed and open to Transmit busses) cannot have the active channel source routing changed.

Trigger Path Live

Up to 4 other channels or stems can be added as triggers to each path live system, allowing faders that are not routed with logical devices designated and source live tags to activate each mic live state. These could be used for submixes from other consoles or Stems that may be a submix from the surface mixing the music segment, while the main surface mixes production. If path formats are changed in console configuration they are automatically removed from the path live configurations.

PGM Transmit Bus

Individual busses are added to the PGM transmit bus assignment by selecting the path from the dropdown list. There are a maximum of 12 PGM transmit busses in each Path Live system. Typically, the master busses that are each format of PGM output would be used, but any Master or Stem bus can be used.

Transmission modes and options

There are 3 transmission modes, these can be selected using the GUI, User keys or GPIs (or other console functions) via Events manager. The active transmission mode is also an events manager source for routing to GPIs or other console functions. The global system always changes the transmission state of the studio and control room systems, but each other systems transmission mode can then be altered independently.

- OFF - OFF is also the default state, this is entered if Rehearsal or On Air are turned off ("OFF" cannot be turned off)
- Rehearsal/Break - Typically used when the console is in use but not on air
- ON AIR

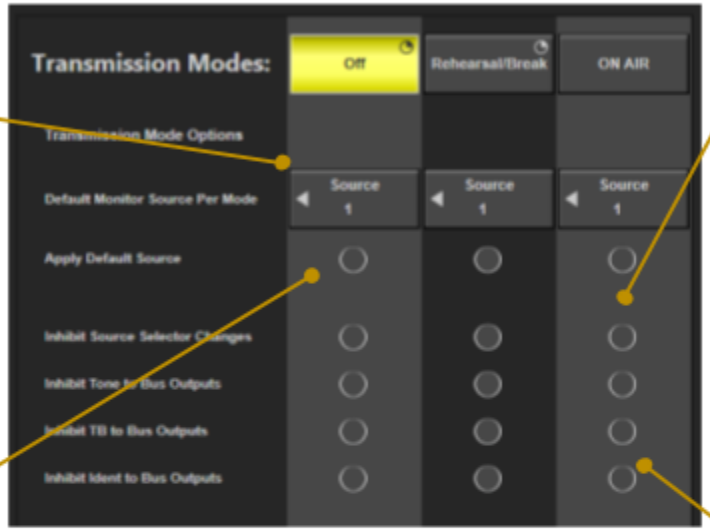
The GUI buttons only turn the mode on, i.e. they are an inter cancelling set of 3 modes:

- "OFF" - press and hold
- "Rehearsal ON" - press and hold
- "On AIR ON" - press (not hold)

For the non global systems with associated monitor outputs the transmission mode options are for settings when the user selects the transmission mode. The mic live state has no impact on these options.

A default monitor source for each speaker output can be selected for each transmission mode. This source is automatically selected when entering this transmission mode for that particular speaker set. For Studio Speakers this is any of the 1-24 source selectors, for control room monitors this is main, Ext 1 or Ext 2 therefore the current signal selected to either of these externals will be heard.

Apply Default source must be checked for the source selection to be applied when each transition mode becomes active.



There is also an option to inhibit all the source selector changes when in a particular transmission mode, this prevents any source selection changes via the screen, user keys or events manager.

There are options to inhibit the Tone, TB and Ident switching on the PGM Transmit busses designated for each path live system. These are available for the global path live system as well as the individual speaker systems. If Tone, TB or Ident is switched in on any of the designated busses when moving to a transmission mode with inhibit to bus set, the tone, TB or Ident is automatically turned off and cannot be turned on while in this transmission mode. If the same bus is used in multiple path live systems, the path live system inhibiting these features has priority.

Mic Live and mic live actions

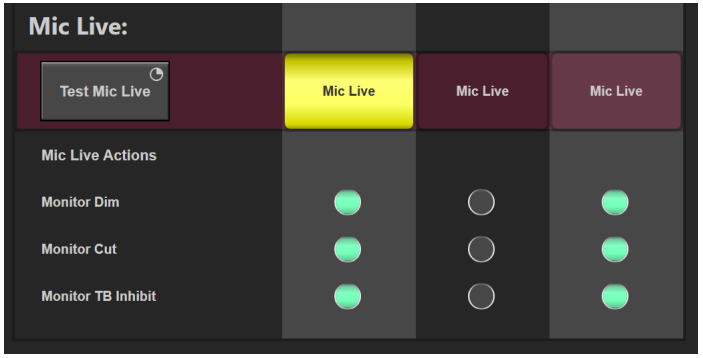
Within each transmission mode there are a set of actions that can be activated if Mic Live becomes true.

For Studios these are:

- Monitor Dim
- Monitor Cut
- TB inhibit - If TB is turned on it is turned off (and stays off) and cannot be set to on while Mic live is true

For Control Room Speakers these are:

- Monitor Dim
- Monitor Cut

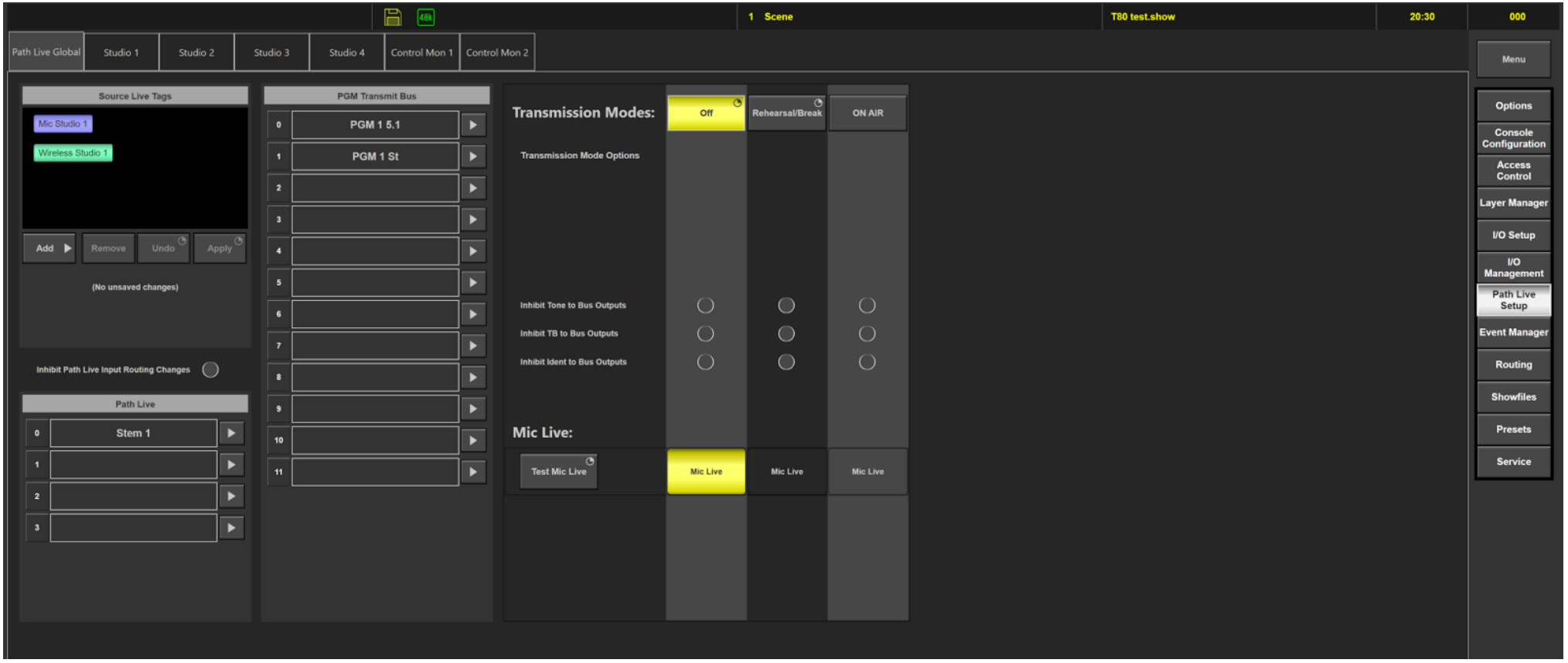


Cut and Dim Mic live actions are triggered if Mic live becomes true, but are not locked in this state, the user can still use the GUI or User keys to override the state that is triggered by the mic live system. This way if the user really needs to unmute the speakers and turn them down (e.g. someone's IFB breaks) then they can without having to go to these pages. Similarly, the Mic live system will never disengage cut or dim if a user has manually engaged them.

Path Live Global

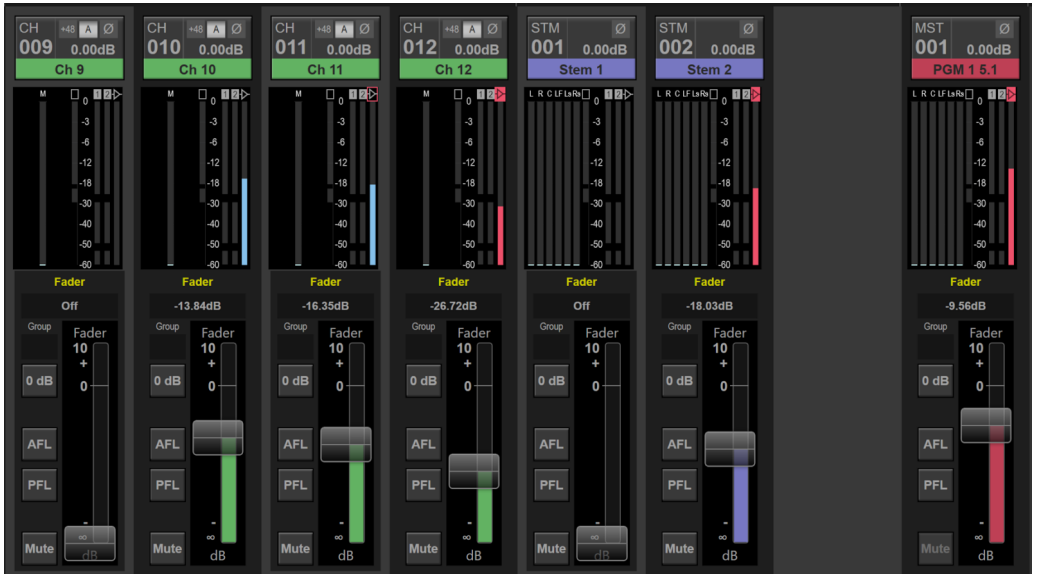
Path Live Global is not associated with a particular speaker output but it does have its own Mic Live state. In this tab changing the transmission mode is global, affecting all the studio and control monitor path live sections' transmission modes at the same time. When the transmission mode is changed globally, it is still possible to change the transmission state of an individual studio or monitor output. The transmission mode options are individual for each path live page, and as there are no associated monitor outputs, the Transmission mode options and Mic live actions associated with the Studio and Control monitor outputs are not available in path live global page.

Within the studio and monitor outputs path live system, the source live tag, path live trigger and PGM Transmit Bus selection can be set to "Use Path Live Global" settings. When this radio button is selected the assignment GUI elements are not available but show (read only) and use the settings of the global tab. Turning on "Use Path Live Global"does not delete the assignments that have previously been set for this studio/control mono output.



Path Live Tally

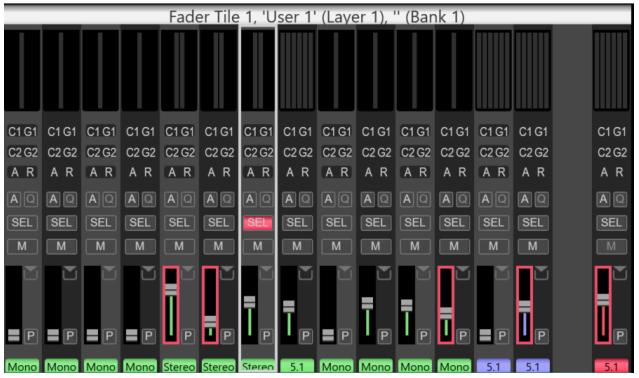
Any paths tagged path live and contributing to the mic live state of the global configuration shows a tally in the channel meter and overview page when they are live. This is especially useful for systems running under production automation, where the overview page can be used to instantly show all signals that are contributing to PGM even if not assigned to a layers on the console. If you do not want to use this tally feature do not use the source live tag, path live trigger and PGM Transmit Bus selection in the path live global tab.



For channel paths where the source is assigned to the global path live systems, a red square is displayed behind the fader symbol in the metering. This is also true of stems involved in the signal flow that contribute to path live logic.

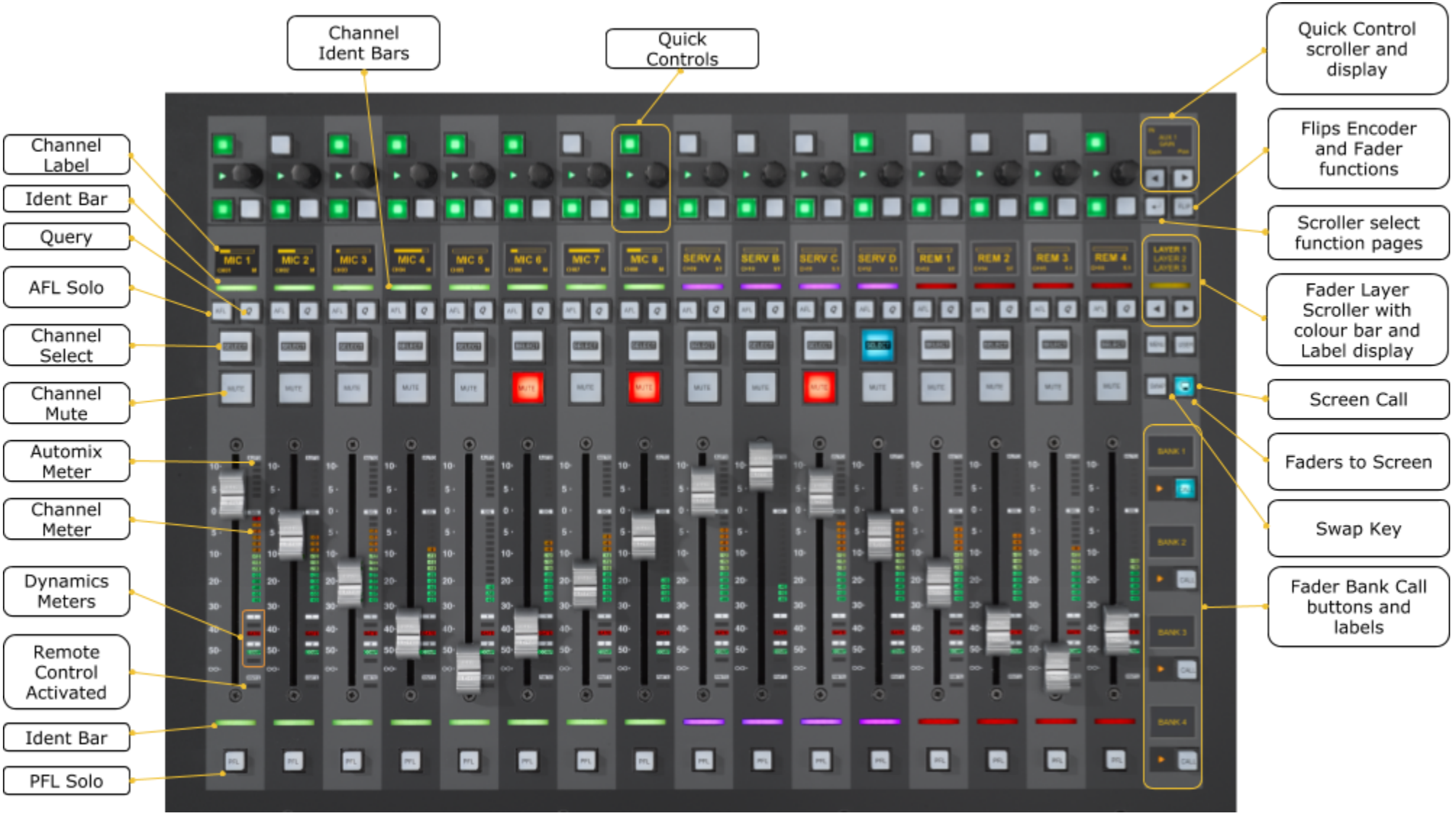
The transparent square (shown in ch11) indicates the path is part of the global path live system but the path is not live, note the fader level is still shown in blue as this fader is open but the channel is not going to air (e.g. the stem that this path is routed to is not open).

The filled square (shown in ch12) indicates the path is live (fader open, mute off, routed to one of the designated path live Tx busses, and that bus fader is open and mute off.) The fader level for this on air path shows in red.



The faders outlined in red in the overview screen indicate that the paths are live.

Fader Tile(s)


Channel Ident Bars
Quick Controls
Quick Control scroller and display
Channel Label
Ident Bar
Query
AFL Solo
Channel Select
Channel Mute
Automix Meter
Channel Meter
Dynamics Meters
Remote Control Activated
Ident Bar
PFL Solo
Flips Encoder and Fader functions
Scroller select function pages
Fader Layer Scroller with colour bar and Label display
Screen Call
Faders to Screen
Swap Key
Fader Bank Call buttons and labels

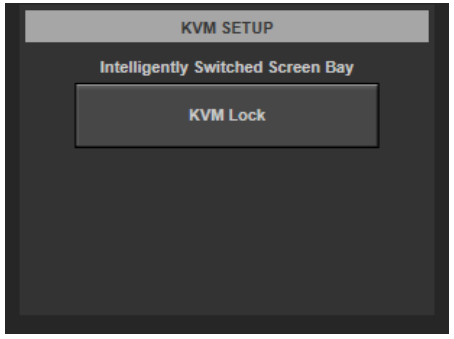
Fader Tile Features

- 16 Faders.
- Colour Ident Bars
- 16 'Quick Control' sets consisting of a Touch sensitive encoder with 3 momentary switches
- High resolution and contrast dot matrix OLEDs displays.
- Automix attenuation leds.
- Pre Fader Meters with a 60dB dynamic range
- Dynamics Section gain reduction indicators - single tri colour variable brightness led for compression/de-essing gain reduction
    - Green <6dB, Orange >6dB, Red >12dB with a Blue De-ess (DS) mode indicator.
    - 'Traffic light' indicators for the gate/expander but with single led around text (showing green for open, red for closed and Orange for transition (either open→closed or closed→open)).
- 15 Fader layers, 4 Fader banks per layer.

Swap (tile function)

The swap key on the fader tiles swaps the source tile to the location of the tile below the screen within each screen group per user.
Note: Screens with only 1 fader tile as part of their screen group do not have a swap function.

KVM Lock



In **Setup, Option, Surface** under **KVM setup**, KVM lock can be selected. This prevents the intelligently switched screen bay function where the channel view follows the screen group of the selected fader tile on consoles with dual screens. KVM lock is useful for certain surface layouts where keeping the channel view on one screen is preferable. KVM lock does not stop the external KVM switching from working.

(*Swap still functions on the screen groups so with KVM lock the tile from the screen group that includes the overview screen cannot be swapped in under the locked channel view position)*

KVM only switches when screen present

The External KVM inputs monitor if a device is connected and can only switch when the device is present, the user keys show a device present with a half lit indication, they are fully lit when the KVM is switched to the corresponding input.

Fader Layers
Each Fader tile addresses up to fifteen layers, each layer contains four banks, and each bank has up to sixteen faders.

There are two types of layers: System and User:

1. System layers contain every path type entered in Console Configuration setup page. Think of system layers as the raw material for building your user layers. System layers are accessible in the Layer Manager or via the **Layers** button in the Channel View display, but they cannot be directly called on to the physical control surface

2. User layers are the layers you access on the physical control surface. Each fader tile may have a unique layout- you may arrange the console exactly how you prefer at any time, live!

User layers are configured and named in the Layer Manager, detailed in the next sections.

Fader Banks
The fifteen layers can be scrolled using the up and down arrows on the tile. The banks within that layer will be shown in the scribble displays near the call buttons.

Press **CALL** and that bank's paths will appear on the 16 fader strips.

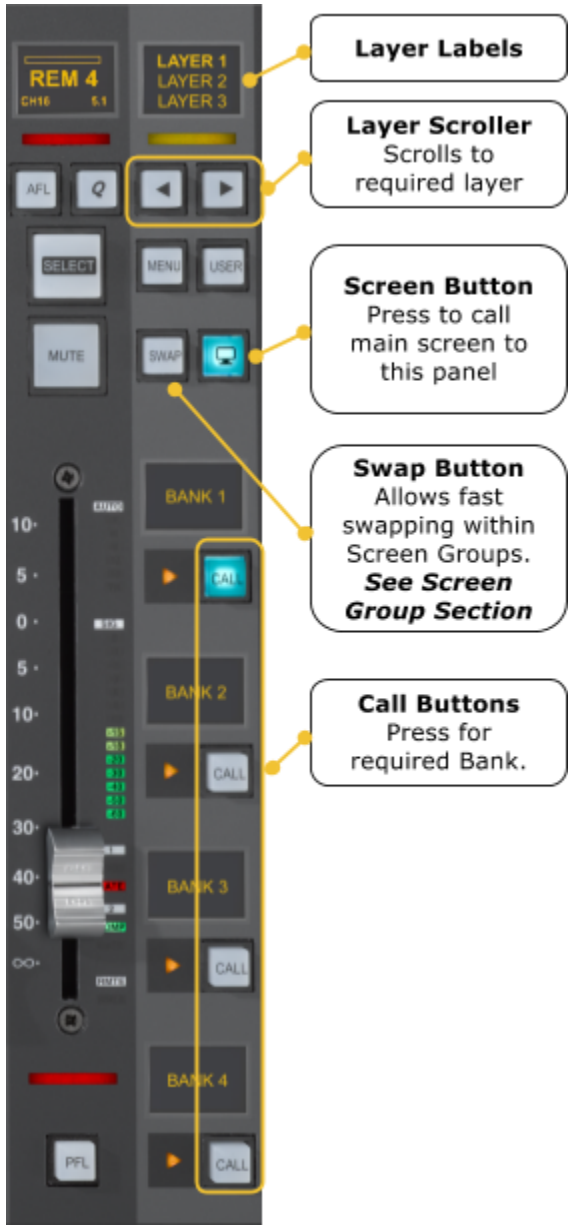
A bank may not automatically appear in the main touchscreen. Press the S**creen** button to assign that tile to the main screen. Holding screen will enable screen follows selection.

Layer Manager
Loading the Showfile may well provide a suitable arrangement of channels in the console's layers and banks. However, the arrangement is entirely flexible so paths/channels may be arranged to suit the preferred method of working.

We strongly advise you to complete any changes to the Console Configuration setup before working on the arrangement of channel Layers, as the Console Configuration defines what channels are available to the Layers.

There are two types of layers: System and User.

The System Layers include every channel which exists in the Console, in order of type. Think of the System Layers as the store of raw materials used to build User Layers. System Layers cannot be edited, and cannot be directly **Called** onto the control surface.



The User Layers allow the channels in the System Layers to be arranged in any configuration, and it is these layers which are **Called** onto the control surface. Each channel can be duplicated in as many User Layers as necessary.

Each Fader Tile has its own User Layers. There can be up to six Layers for each Tile, and each Layer can have four Banks of 16 Faders. Banks are called onto the surface by scrolling to their Layer using the arrow buttons to the right of the Solo buttons, then pressing the appropriate Bank Call button.

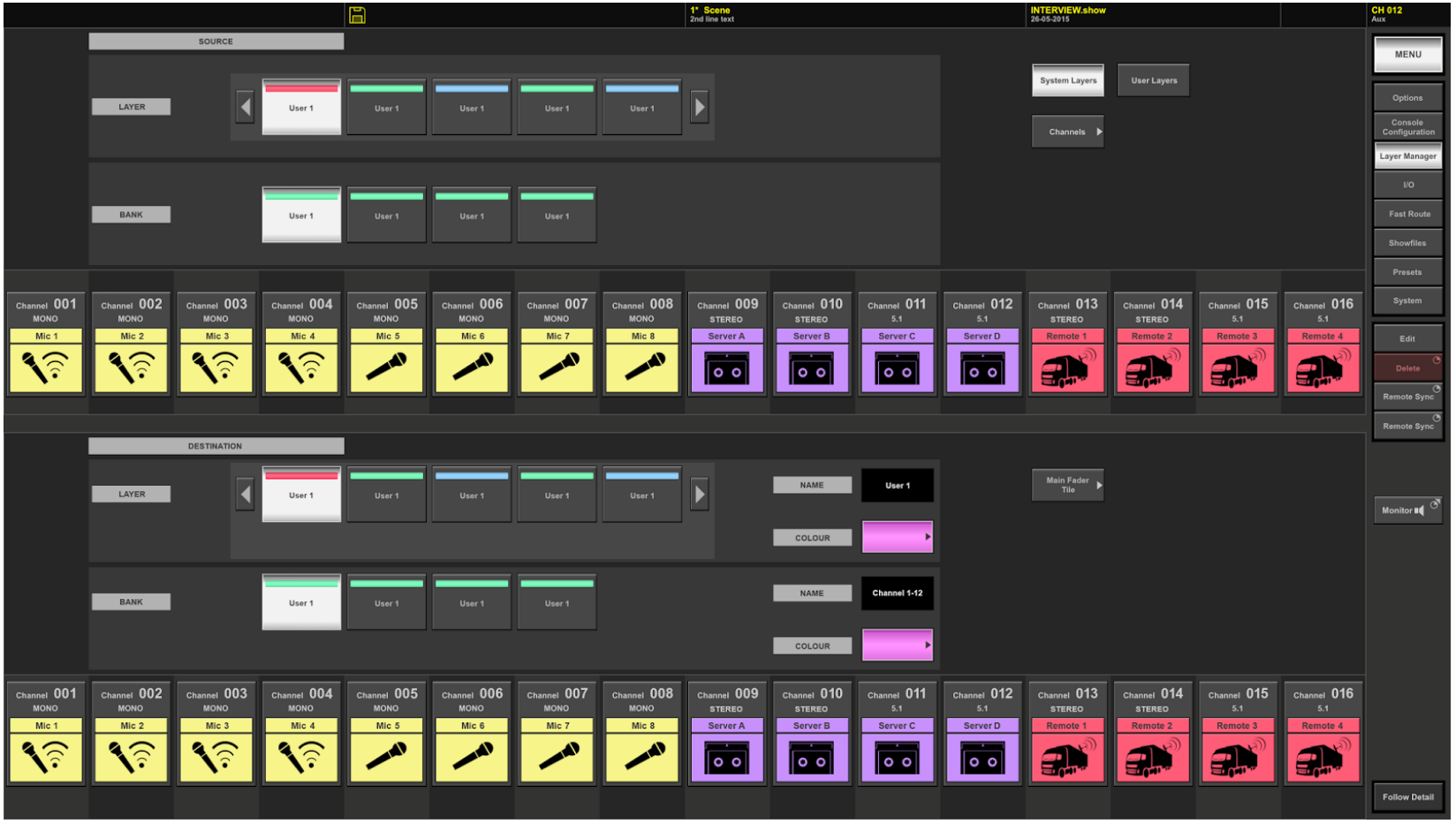
Layer Manager Screen

User Layers are rearranged using the Layer Manager, accessed via the Setup submenu of the Menu button:
Menu|Setup|Layer Manager

Layer configuration uses a drag-and-drop method to copy channels from the System Layers, or from their current locations in the User Layers, into new User Layer locations.

The Layer Manager screen is arranged in two halves: the Bank you are copying from is shown in the top half (**Source**), and the Bank being built is shown in the bottom half of the display (**Destination**).

The Source Layers can be copied in complete Layers, in complete Banks, or in a selection of individual channels within a Bank.



Setting Up User Layers

Select the Destination Fader Tile, Layer and Bank:

- Touch the Fader Tile 'n' select button in the lower right quadrant of the screen and select the Tile containing the Destination Bank using the submenu which appears;
- Touch the **Destination** Layer icon (lower half of the screen) for the required Layer. It will go light grey and its Banks will be shown beneath it.
- Touch the required Destination Bank button. Its current channel layout will appear in the channel display at the base of the screen.

Select the Source Set, Tile, Layer and Bank:

- Define which Set of Layers are being displayed in the top half of the display by touching the System Layers or User Layers button (top right corner of the screen);
- Touch the Fader Tile button below the **Source** label (towards the upper left corner), and select the desired channel type;
- Touch the relevant **Source** Layer icon (near the top of the screen). Its Banks will be shown beneath it.
- Touch the relevant Source Bank icon. Its channels will appear in the channel display beneath it.
- Touch the channel(s) to be copied to highlight them.

The selected channels do not have to be consecutive channels; However, they will be copied into consecutive channel slots, overwriting any channel assignments which were previously in those locations.

Drag the selected channels into the Destination Channel area:

- Click on one of the selected channels, and drag them into the channel display at the base of the screen. The drag icon indicates how many channels are being dragged.
- Position the drag icon so that its first channel is over the first Destination channel slot. The icon's outline will change from red to cyan when it is in a suitable position to be dropped.
- Drop the channels into position.

Rearranging The Destination Bank

You can rearrange the channels within the Destination channel display using a similar drag-and-drop procedure. Note, however, that this procedure involves moving channels, rather than copying and overwriting them:

- Click on a channel to be moved, and drag it to a new location within the Bank. The drag icon's outline will change from red to cyan when it is in a suitable position to be dropped.
- Drop the channel into position. The channels in between the old and new location will all shift to accommodate the change.

Only the clicked channel will be dragged. Other highlighted channels will not be included in the drag.

Copying Complete Banks

Select the Destination Fader Tile and Layer, and the Source Set, Tile and Layer, as described above.
Click on the Source Bank icon for the Bank to be copied, and drag it onto the appropriate Destination Bank icon. The drag icon's outline will change from red to cyan when it is in a suitable position to be dropped.
Drop the Source Bank onto the Destination Bank. The Destination Bank can now be rearranged as described above.
Note that the Source Bank's name and colour will be copied to the Destination Bank. These can be changed as described below.

Copying Complete Layers

Select the Destination Fader Tile, and the Source Set and Tile, as described above.
Click on the Source Layer icon for the Layer to be copied, and drag it onto the appropriate Destination Layer icon. The drag icon's outline will change from red to cyan when it is in a suitable position to be dropped.
Drop the Source Layer onto the Destination Layer. This will copy all the Banks within the Source Layer to the Destination. The Destination Layer's Banks can now be rearranged as described above.
Note that if the Destination Layer icon is not highlighted, nothing in the display will change to indicate that the Layer has been copied.

Naming And Colouring Layers And Banks

Each User Layer and Bank have customisable colours and names. Their colour and name are shown in and above their Layer or Bank Selector buttons on the control surface.
The Layer and Bank Name and Colour selectors are located to the right of the Layer and Bank icons in the Layer Manager screen, and refer to whichever Layer and Bank are highlighted to their left.

Names

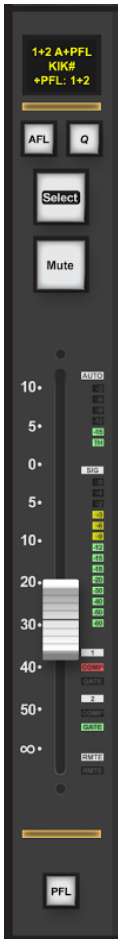
System Layers and Banks are named according to their contents. User Layers and Banks can be given User names as follows:
Select the Tile and Layer (and Bank, if relevant) in the **Destination** area, as described above.
Double-tap the appropriate Name text box underneath the **Layer Name** or **Bank Name** label – a keyboard will appear.
Delete any current text if required, using the red arrow buttons.
Type the new name and press **OK**.

User Layers or Banks which are direct copies of System Layers/Banks will initially be given the same name and colour as the System Layer/Bank.

Colours

To change the colour for a Layer:
Select the Tile and Layer (and Bank, if relevant) in the Destination area, as described above.
Touch the appropriate Colour selector, then select a colour from the drop-down list which appears.

Fader Strip Functions



Above the fader:

- **AFL** routes the channel to the AFL buses.
- **Q** (Query Button) is used for viewing all routes to and/or from a channel, as described on the following pages.
- **Select** assigns the channel in the Channel Screen, the Channel Tile, and to the Focus Fader and controls.
- **Mute** silences the channe.

Below the fader:

- **PFL** routes the channel to the PFL buses;

The fader has a backstop PFL feature, where an over press on the fader knob will trigger the PFL function. This can be enabled/disabled via **SOLO SETUP** in the touchscreen **Menu|Setup|Options|Path** page.

The AFL and PFL buttons have an automatic Latch/Non-Latch action determined by the duration of the button push. A short push will latch the function, holding the button will cause the function to cancel when the button is released.

Normally the Path AFL and PFL buttons intercancel. The **SOLO SETUP** Menu has options for the AFL and PFL functions to be **Additive**. For the PFL function there are additional options for an active PFL key on a Path with a closed fader to automatically cancel when the fader is opened. A further option enables PFL to be re-activated when the fader is subsequently closed.

Regardless of the AFL **Additive** setting, AFL can be enabled on multiple paths by simultaneously activating the AFL keys. *Note for the PFL function, unless the Additive mode has been enabled, only one path will be enabled even if multiple PFL keys are operated concomitantly.*

Q - Query Button
Query mode is used to interrogate a particular channel path in order to see what other paths are routed to or from it.

On an Input Channel, pressing the **Q** ('Query') button collects or displays all the Output Channels routed from that channel plus any VCAs controlling the Channel
On a Stem Channel, pressing the **Q** ('Query') button collects or displays all channels routed to the stem, all the Output Channels routed from the stem, plus any VCAs controlling the stem.
On an Output Channel or VCA, pressing the **Q** ('Query') button collects or displays all channels routed to that channel or controlled by that VCA.

Whether the **Q** ('Query') button 'collects' or displays the routed channels is a function of the **Query Mode** setup for the specific Path type and is set up from the **QUERY SETUP** in the touchscreen **Menu|Setup|Options|Surface** page.

If the **Query Mode** is set to **Spill**, collected channels are placed onto the control surface, employing all Fader Tiles apart from the one which contains the 'Queried' channel, and replacing the currently selected bank. Using the **Q** ('Query') button on the Focus or Master Fader utilizes all available fader tiles for the collected channels. The bank select button labels will have reversed black text on a yellow background displaying the Bank contents. On the active queried path the **Q** button will flash Green to indicate that it is the active queried path.

If there are more channels collected than can fit on the available tiles, additional fader banks will be created which are accessed using the **Call** buttons in in the layer select area of the tile on the right hand side.

If the **Query Mode** is set to **InPlace,** the existing fader banks remain unchanged. Instead the the channel Query buttons light to indicate paths assigned to and from the Queried Channel. The **Q** ('Query') button will light Green on any paths routed to the Queried channel, Red on paths that the Queried channel is routed to, and Blue on any VCAs assigned to control the path. On the active queried path the **Q** ('Query') light will flash Purple.

Show Mode determines whether the Quick Controls and the Faders can be used to set aux levels or change path assignments of the collected or displayed channels. With **QuickControls** enabled, the Upper Encoder switch will remove a channel from a Queried output path or VCA, and on a Queried Input Channel, remove the route to an output channel. When an Aux Bus has been queried then the channel encoders control the send level and panning as determined by the two lower switches. *Note that in **Spill** mode, removing a route using the upper encoder switch will also remove the path from the Spill Bank so should be used with care.* **Faders** automatically flips the send level control on to the Fader leaving the encoder as the send pan control. The Upper Encoder switch has the same function as for the **QuickControls** mode.

The **Q** button will flash until it is pressed again, cancelling the Query function and returning the Fader Tiles to their previous assignment..

Query Route Mode

The **Q** button can also invoke a powerful routing option for quickly setting console bus and VCA assignments. It utilises the existing Layers and Banks, so some forethought on how these are configured will pay dividends in the use of the **Query Route** function.

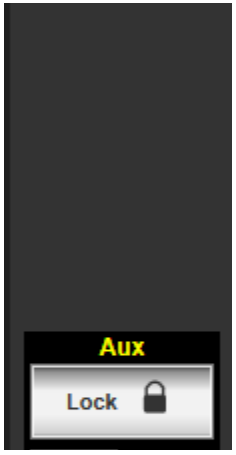
To route a number of channels to an Output bus or VCA, press and hold the **Q** key on the target bus fader, it will flash purple. Any Channels currently routed to the Queried bus will have their **SEL** keys flashing as well as the **Q** buttons lit Green. Use the **SEL** keys to assign other Channels to the Queried bus or to remove existing routes. Range routing is supported by operating a second **SEL** key whilst the first is still selected. All channels in between the keys will be routed.

For single channel bus or VCA routing, press and hold the **Q** key on the source channel, which again will flash purple. Then use the layers and banks on another fader tile to access the destination buses or VCAs. Make a route using the **SEL** keys as before. The **Q** keys on the routed buses will be RED and on assigned VCAs they will be BLUE.

Path Lock

Path lock is available for the fader tile that is called to the screen with channel view, which, when engaged, locks the path fader in that position on the tile so that bank or layer switching does not change that particular fader. Press and hold the on-screen padlock button just above the channel label at the base of the channel strip to engage path lock for the relevant fader. When enabled the GUI button is shown in light grey and a padlock symbol is shown on the tile OLED

Path Link



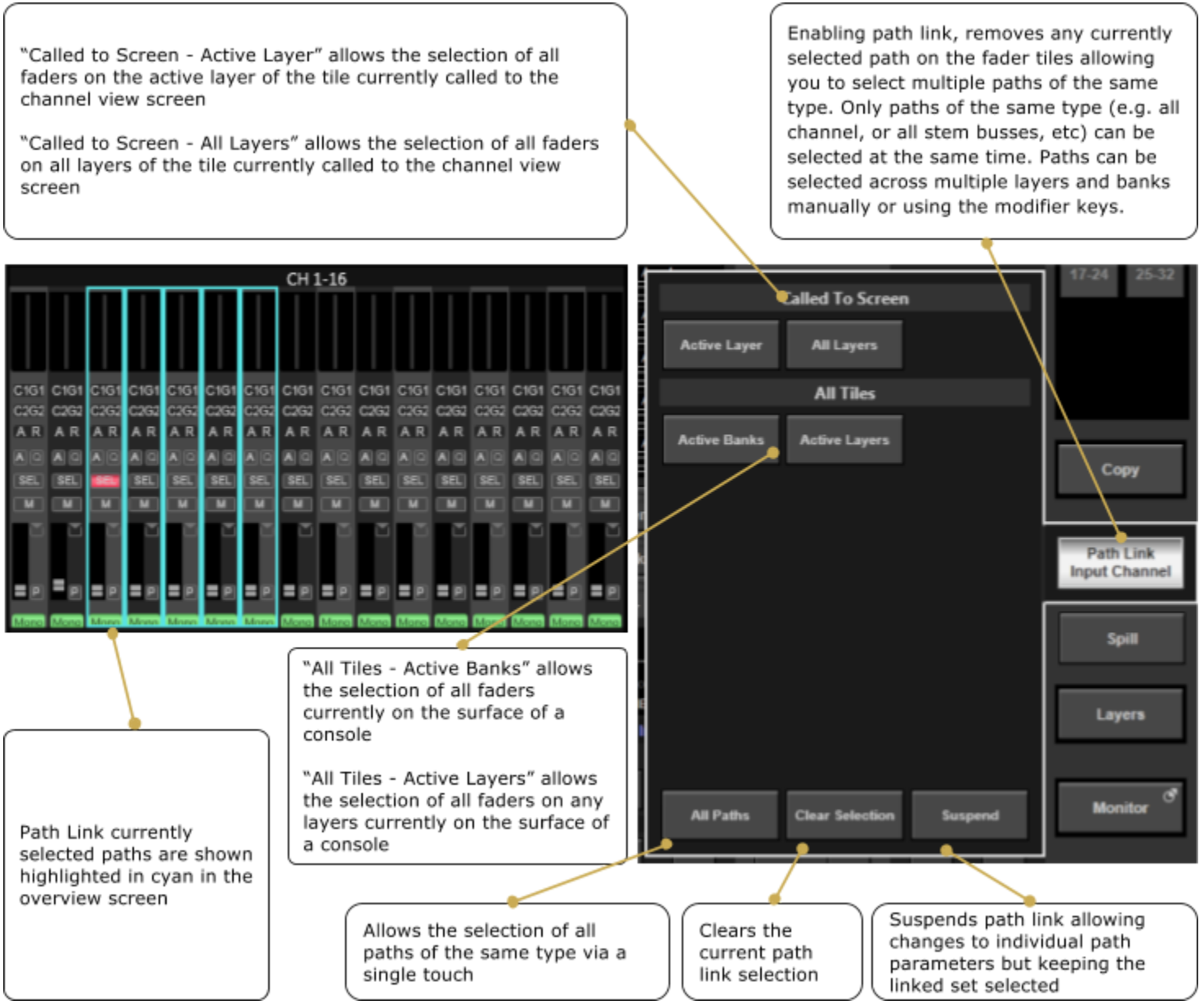
Path Link allows parameter changes to be made to multiple paths at the same time. This temporary link can greatly reduce setup time, for example routing multiple channels to the same busses simultaneously. Or can be used to alter the same parameter across multiple paths, for example adjusting mic gain across a range of Mic Pre inputs. The "Path Link" button is available in the sidebar of the main channel view page.

Enabling path link, removes any currently selected path on the fader tiles allowing you to select multiple paths of the same type, either individually or using the press and hold range select process via the hardware select (SEL) buttons on the fader tiles. Only paths of the same type (e.g. all channel, or all stem busses, etc) can be selected at the same time. Paths can be selected across multiple layers and banks.

When paths are linked together level parameters maintain their relative offset, frequencies maintain their relative octave relationship and switch functions follow the state of the path that the change is instigated from.

Deselecting Path Link clears all the selected paths in the Link and reverts the SEL key back to the normal path select function.

Path link - Quick Selection Modifiers


"Called to Screen - Active Layer" allows the selection of all faders on the active layer of the tile currently called to the channel view screen
"Called to Screen - All Layers" allows the selection of all faders on all layers of the tile currently called to the channel view screen
Enabling path link, removes any currently selected path on the fader tiles allowing you to select multiple paths of the same type. Only paths of the same type (e.g. all channel, or all stem busses, etc) can be selected at the same time. Paths can be selected across multiple layers and banks manually or using the modifier keys.
CH 1-16
Called To Screen
Active Layer
All Layers
All Tiles
Active Banks
Active Layers
17-24
25-32
Copy
Path Link Input Channel
Spill
Layers
Monitor
All Paths
Clear Selection
Suspend
"All Tiles - Active Banks" allows the selection of all faders currently on the surface of a console
"All Tiles - Active Layers" allows the selection of all faders on any layers currently on the surface of a console
Path Link currently selected paths are shown highlighted in cyan in the overview screen
Allows the selection of all paths of the same type via a single touch
Clears the current path link selection
Suspends path link allowing changes to individual path parameters but keeping the linked set selected

Path Link allows parameter changes to be made to multiple paths at the same time. This temporary link can greatly reduce setup time, for example routing multiple channels to the same busses simultaneously. Or can be used to alter the same parameter across multiple paths, for example adjusting mic gain across a range of Mic Pre inputs. The **Path Link** button is available in the sidebar of the main channel view page.

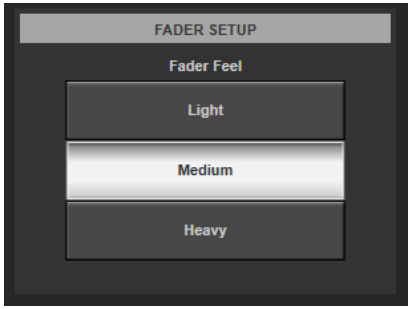
Enabling path link, removes any currently selected path on the fader tiles allowing you to select multiple paths of the same type, either individually or using the press and hold range select process via the hardware select (**SEL**) buttons on the fader tiles. Only paths of the same type (e.g. all channel, or all stem busses, etc) can be selected at the same time. Paths can be selected across multiple layers and banks. Using the path link modifiers selecting large numbers of similar paths across multiple layers and tiles is quicker.

When paths are linked together level parameters maintain their relative offset, frequencies maintain their relative octave relationship and switch functions follow the state of the path that the change is instigated from.

Deselecting Path Link clears all the selected paths in the Link and reverts the **SEL** key back to the normal path select function.

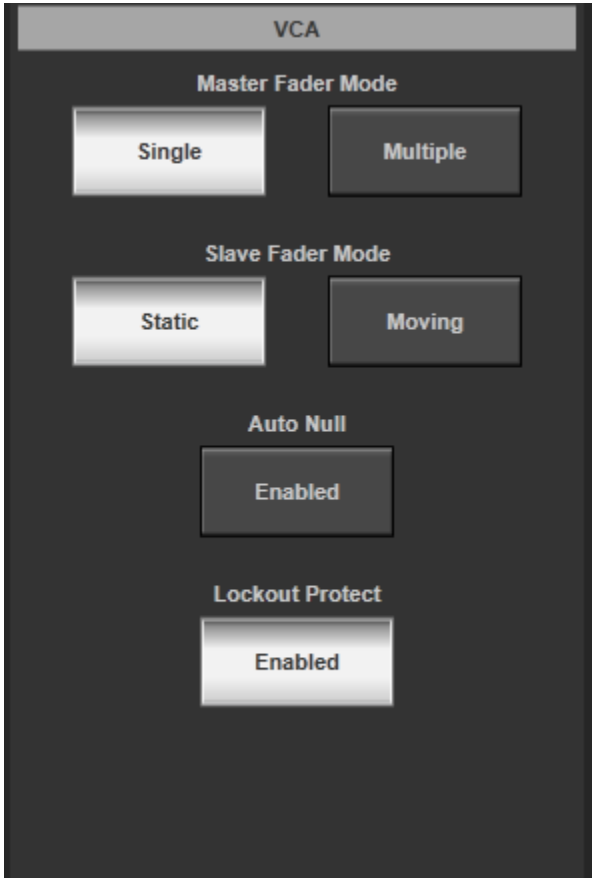
Fader Feel (light, medium, heavy)

In **Setup, Option, Surface** you can alter the fader feel between 3 modes.



Fader Control Groups (VCAs)

A group of channel faders can be controlled from a single fader using the console's 32 VCAs. You can add channels to VCAs by selecting the VCA Assign button in the Channel Fader Detail view or via the Query Route feature.



VCA Masters can be 'nested' i.e. assigned to other VCA masters to create hierarchical grouping structures. There is no limit to the number of nested levels that can be configured.

From the **Menu|Setup|Options|Path** tab the user can choose various modes that determine the behaviour of both the VCA slaves and the Master faders.

For the Masters, **Single** mode is the standard mutually exclusive style of VCA grouping where a slave can only be assigned to a single master. **Multiple** activates the grouping mode commonly used on Live/Theatre sound mixing consoles where a Slave can be assigned to multiple Master faders, in sense a variant of the 'Nested' Grouping that is often used on Music console with exclusive style VCA grouping.

For the Slave Faders, **Static** is the traditional 'VCA' mode. The Slave faders always indicate their current contribution to path gain Actual path gain is displayed by the vertical gain bar in the path meter display and the dB readout in the upper fader display. The **Auto Null** option enables slave faders to be added or removed from a VCA group without a level change if the Master Fader is not at unity gain. The Slave fader will be automatically repositioned at the correct dB value to null out the level jump that normally occurs on a VCA system when Slaves are added or removed from Master not at 0dB.

With **Moving** enabled, the slave faders track moves made on the VCA master. Touching a slave fader automatically disconnects the slave fader from the master. Releasing the fader will seamlessly renull to the current master position with no change in Slave level. This mode is equivalent to how grouping functioned on legacy automation systems using moving faders with audio passing through the fader. With **Lockout Protect** ON, moves made on any slave fader whose master is positioned below -50dB are ignored preventing accidental re nulling of the slave fader against the master, and the subsequent Slave level jump when the Master is moved.

The Master and Slave Modes are independent, so that Multiple Masters and Moving Slaves is a valid option!

Master Tile Faders

The console has two additional faders, the **Focus** Fader, and the **Main** fader located on the **Master Tile**.

Focus Fader

The Focus fader, along with its associated Mute, Q and Solo buttons operates on the currently **Selected** channel, either from the Channel or OverView touch screens or via the Fader Tile SEL buttons.

The Focus Fader normally follows the **Select**ed channel, but it can also be 'assigned' to a specific channel. This could be an important Input Channel, VCA, Solo Channel, additional Master etc. that requires quick access to.

To do this, press-and-hold the **Call** button above the Focus Fader. It will flash to indicate it is in setup mode. Press the **Select** button for the required channel. This will also flash to confirm the selection. Press the **Call** button again to finish.

The **Call** button will normally be backlit to indicate it is following the Selected channel on the Fader Tiles. Press the **Call** button to select the assigned Focus channel to the fader and Channel Control Tile. It will light (just like the other **Select** buttons) when selected. Press any other Select button to select a different channel to the Focus Fader and Channel Control Tile.

It is also possible to 'lock' the Focus Fader to the assigned Call channel using the **Lock** button which will light green to indicate the locked state. Pressing any other **Select** button will no longer override the assigned Focus channel.

The **Channel Tile** can also be locked to the Focus Fader's assigned Call channel; Go to the User Options page (**Menu|Setup|Options|Surface** Tab) and enable the **Link Channel Control Tile** button under **Tile Setup** in the **FOCUS FADER LOCK** section. Whenever the Focus Fader is locked to its assigned channel, the **Channel Tile** will now also be locked to that channel and will no longer follow the **Select** button or the small screen **Next** and **Previous k**eys.

Main Fader

The fader on the right of the Master Tile can be assigned to any input or output channel on the console, providing constant control of that channel's level regardless of whether the channel is active in a Fader Tile or not. Typically this would be used for one of the Master Buses it might also be assigned to a VCA which in turn controls a selection of buses.

To assign a channel to the Main Fader:

- Bring the Bank containing the channel to be assigned into a Fader Tile
- Press and hold the **Call** button above the Main Fader until it flashes. The currently assigned channel's **Select** button will also flash;
- Now press the **Select** button for the channel you wish to assign to it – it will flash cyan while the old assignment will stop flashing;
- Press **Call** again to disengage the call function.

Note: The LOCK Button has no function.

Touch Screen Fader Control

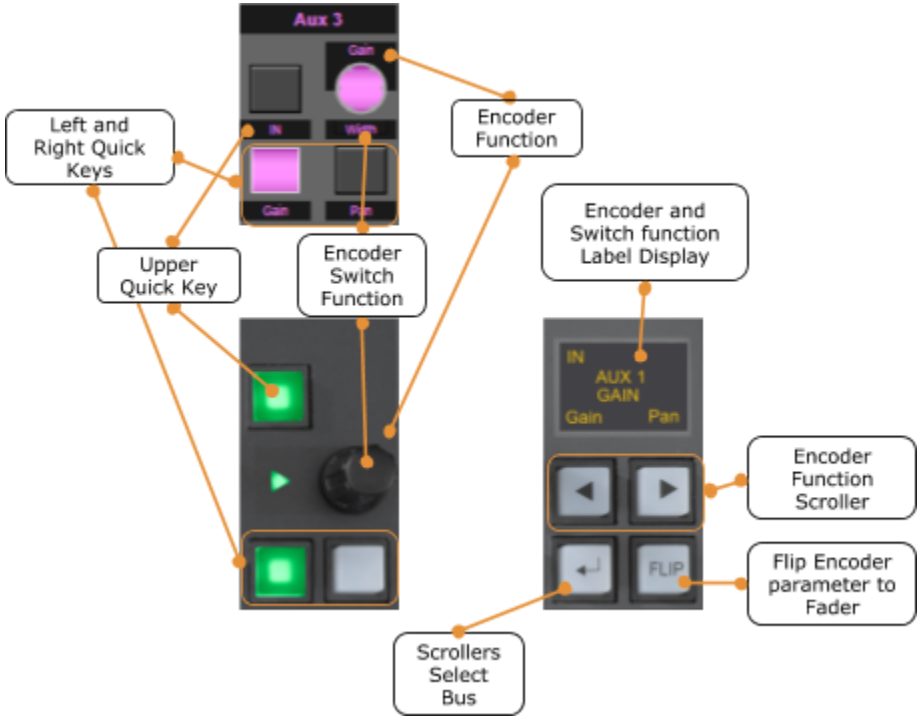
It is also possible to display channel faders in the Upper Context area of the Channel View. This is primarily intended for use when configuring the console offline.

To view channel faders on the screen, select the **Faders** button in the Upper Context Area of the Channel View :

A Fader will appear on the screen, along with its AFL and PFL buttons, and a 0dB button which sets the fader to 0dB.

Channel Gain together with Mute, Solo and the SIP (Solo-in-place) Isolate function will also be assigned to the channel Quick Controls at the top of the fader strip and on the Channel View Screen with **Follow Detail** OFF.

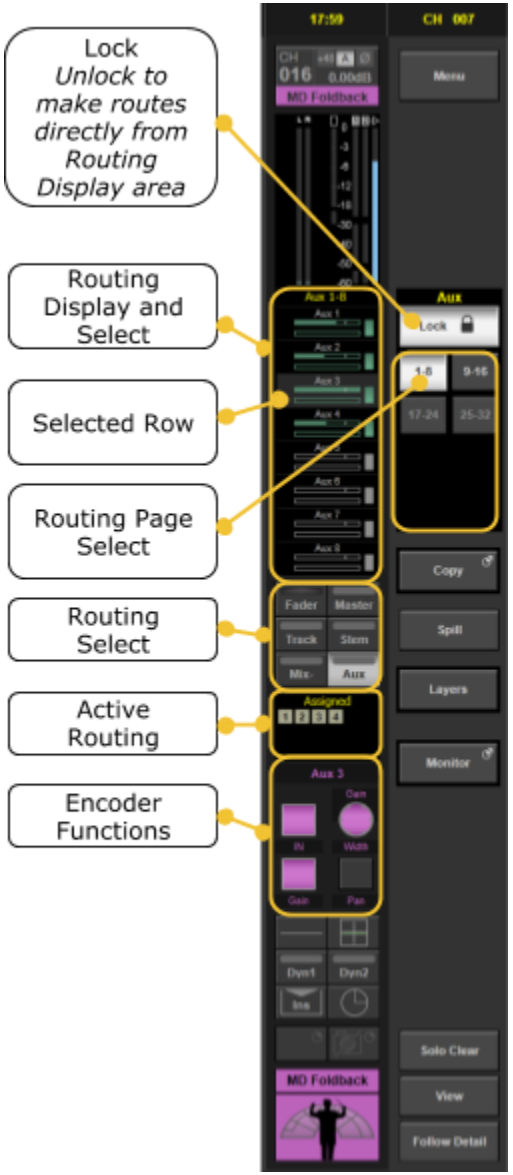
Quick Encoders



The 16 Quick encoders have two modes of operation. As a horizontal strip of controls that can quickly access routing, level, panning and input gain, or in conjunction with the touch Screen Detail view, they can be used to control all parameters of single process, for example an Eq section. This mode is described in the Channel View section.

Changing the assignment of the encoders in strip mode is either via the Function Scroll keys or the two groups of channel Touch screen select buttons, with the upper six buttons accessing console routing in groups of 8 buses and the lower six, processing.

With routing selections, the Left arrow key changes the function of the Scroll keys to select the buses the encoder stip is focused on. Touching a row on screen selects it to the encoders and the touch screen Page Select buttons cycle through groups of eight buses.



Push and hold on the Left Scroller key returns to input control, and on the Right key panning.

The **Upper** Quick key is normally the IN/OUT button with the **Left** and **Right** keys determining the Encoder parameter. The Encoder switch access additional parameter pages indicated by the on Screen Label.

The **Flip** button interchanges the parameters of the fader and the Quick Encoder allowing the faders to be used to perform fine adjustments to Quick Control functions. *The Flip button acts on a per-Tile basis. Press & hold the Flip button to toggle Flip for all Fader Tiles.*

Quick Encoder Fine Adjust Mode

The fader tile encoders have a 'fine' mode allowing the user to select, for example, an exact frequency when notching out tone. This mode is activated whilst the encoder is held down, so pressing whilst turning gives the high resolution 'fine' mode. *N.B. 'Fine' mode operates in parallel with, and independently, of any existing press or press & hold assignments, so if there is a switch function assigned to the encoder press, the user can't access fine mode without also triggering the associated switch function.*

Quick encoder input B switch

The top left button on the first page of the input quick encoder functions is a input B switch, allowing hardware switching on the fader tile between input A and B, typically used for backup microphones. The switch is press and hold and enabled input B, when input B is active the button is red.

Channel Tile

The **Channel Tile** contains a full set of hardware controls for the Channel assigned to the Focus Fader on the **Master tile**. Power, OCP Redundancy changeover, Screen and Surface Brightness controls as well as a USB socket are also located on the tile, together with 4 User programmable function keys.

The primary Control elements consists of the **Focus Fader** in the Master Tile, the Context controls in the bottom left corner of the Channel Tile, and the Channel Tile Screen together with the controls surrounding it.

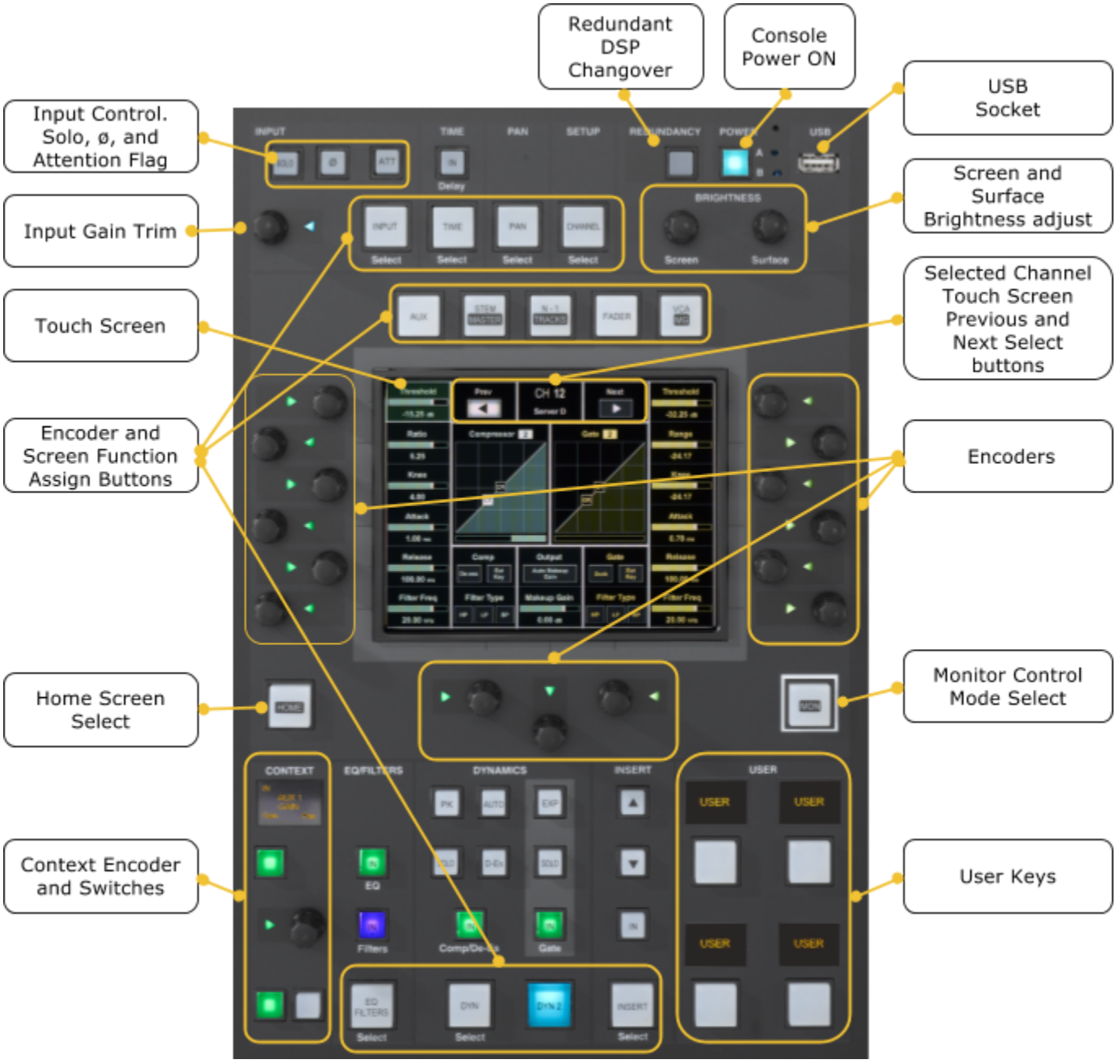
The Focus Fader and Context Quick Controls simply follow the function of the fader and Quick Controls in the 'Selected' channel either using the Fader Tile **Select** buttons or selecting a channel on the Main screen.

The remainder of the Channel Control Tile will follow the channel selection but its function is independent and is described below.

The Channel Control Tile Screen provides a different way of controlling many of the same elements that are found in the Channel Detail Dialogue. However for certain processes such as Eq and Dynamics, certain options can only be selected from the Channel Detail view on the touch screen.

Use the large Function Assign buttons around it to select what to control.

For each function essential control elements are provided by the smaller buttons located with the Function buttons, for Example In/out switching



The encoders below and either side of the screen are used to control whatever parameter is displayed adjacent to it on the screen. You can also touch the screen to switch buttons states or drag the graphs.

The 'Selected' channel is shown at the top of the screen; the **Prev** and **Next** arrow buttons either side of it can be used to scroll through channels sequentially.

Switches are operated by pressing the encoder or directly from the touch screen, and continuous parameters are changed by turning the encoder. For bus routing, touch screen buttons are exclusively used.

The LED next to each encoder is lit whenever the encoder is assigned to any on-screen parameters. The display in the context area indicates the function of the adjacent context controls.

Some Assign buttons are dual-function, shown by two titles on the button. These open dual-function vertically split GUI pages.

Fine Adjust Mode

The encoders have a 'fine' mode allowing the user to select, for example, an exact frequency when notching out tone. This mode is activated whilst the encoder is held down, so pressing whilst turning gives the high resolution 'fine' mode.

- ***Note: This operates in parallel with and independently of any existing press or press & hold assignments, so if there is a switch function assigned to the press then the user can't access fine mode without also triggering that switch function.***

Home Button

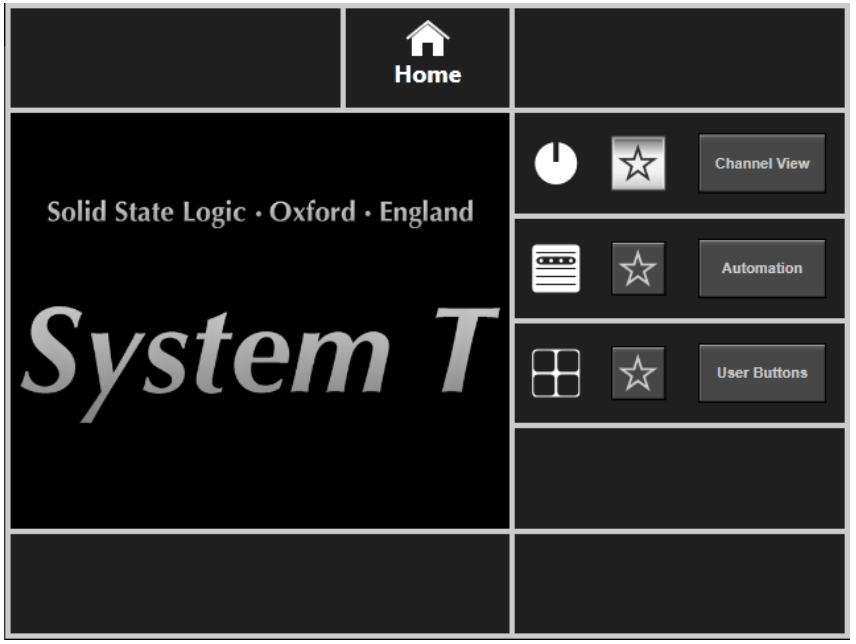
The Channel Control Tile can also be used to view other sections of the console. The **Home** button provides access to the following options

Press the **Channel View** (or any Function assign button) to access parameters for the selected channel. (as described above).

Press the **Automation** button to view a summary of the upcoming automation scenes. See the Automation Section for more information.

Press the **User Buttons** for access the functions programmed on the Chanel Tile User keys and the master Tile User encoder switches.

Any of the pages above can be stored as a quick access page; press the star button adjacent to the page button of interest. Pressing & holding the Home button at any time will then jump the Channel Control Tile screen to the selected page.



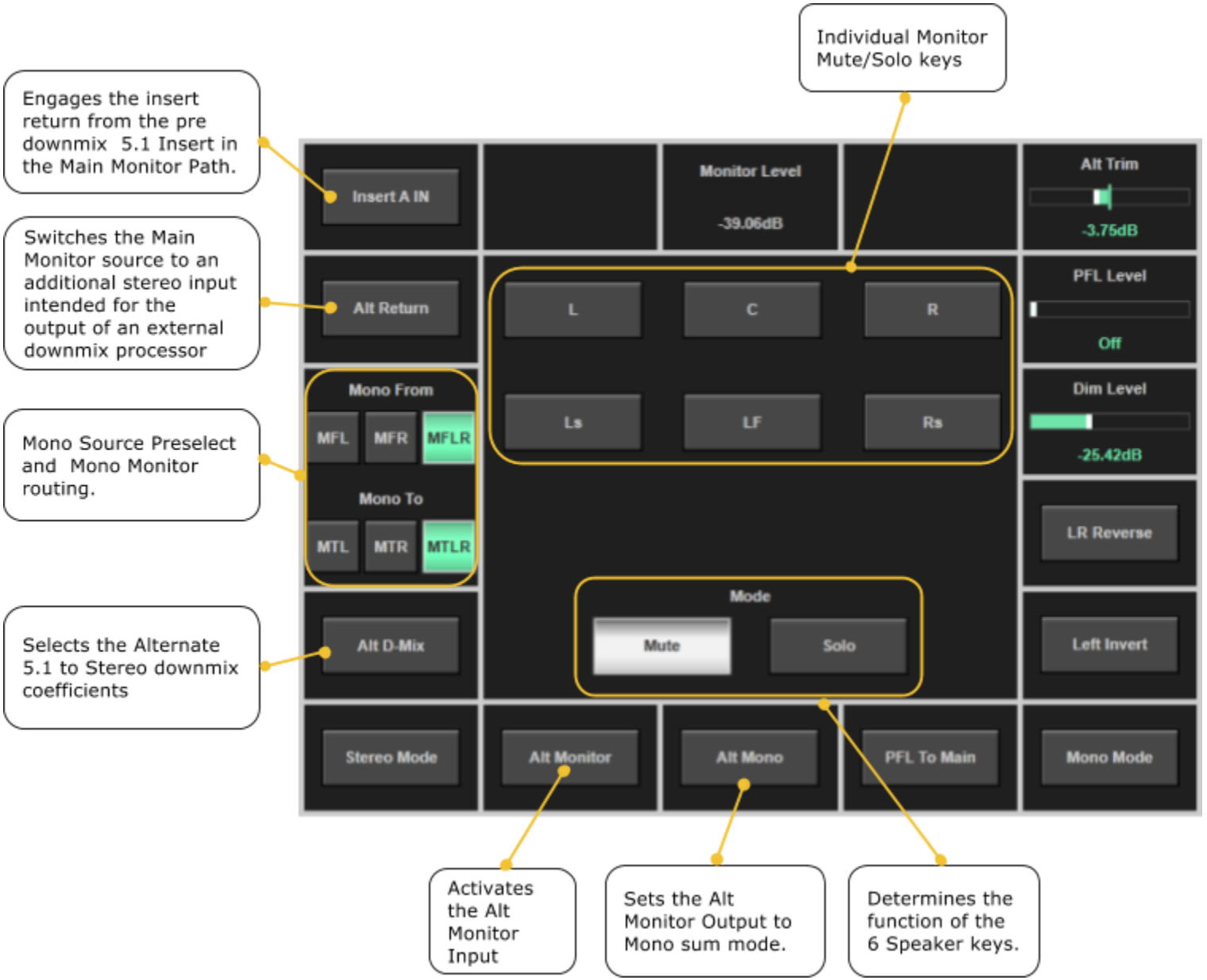
Small screen user keys

In addition to the 4 user keys and 5 user encoder switches, the channel tile small screen has 10 soft user keys. These are also assigned from the **Setup, Options, User** tab. Functions for the specific keys should be added using the arrow and drop down on the right hand side. If the text for the user key needs to be changed double tapping the text within this configuration page will bring up the standard on screen keyboard. Once assigned the user keys can be brought to screen by pressing the **Home** hardware button and **User** softkey.

Note: If Events Manager User Key Sources are assigned to these small screen user keys, they should be set to latching (not momentary).

Mon Button

Press the **Mon** button to access the external monitor control features. *Only features that are in addition to those available on the main monitor panel are annotated in the screenshot below.*



Master Tile

Mute Groups
System T has ten mute groups, controlled using the ten Mute Group buttons on the Master Tile. Channels paths of any type can be included in Mute Groups, and each channel can be in any number of Mute Groups.

To mute all signals in a Mute Group, simply press the relevant Mute Group button. The Mute Group button will go orange as will the mute buttons for all channels included in it.

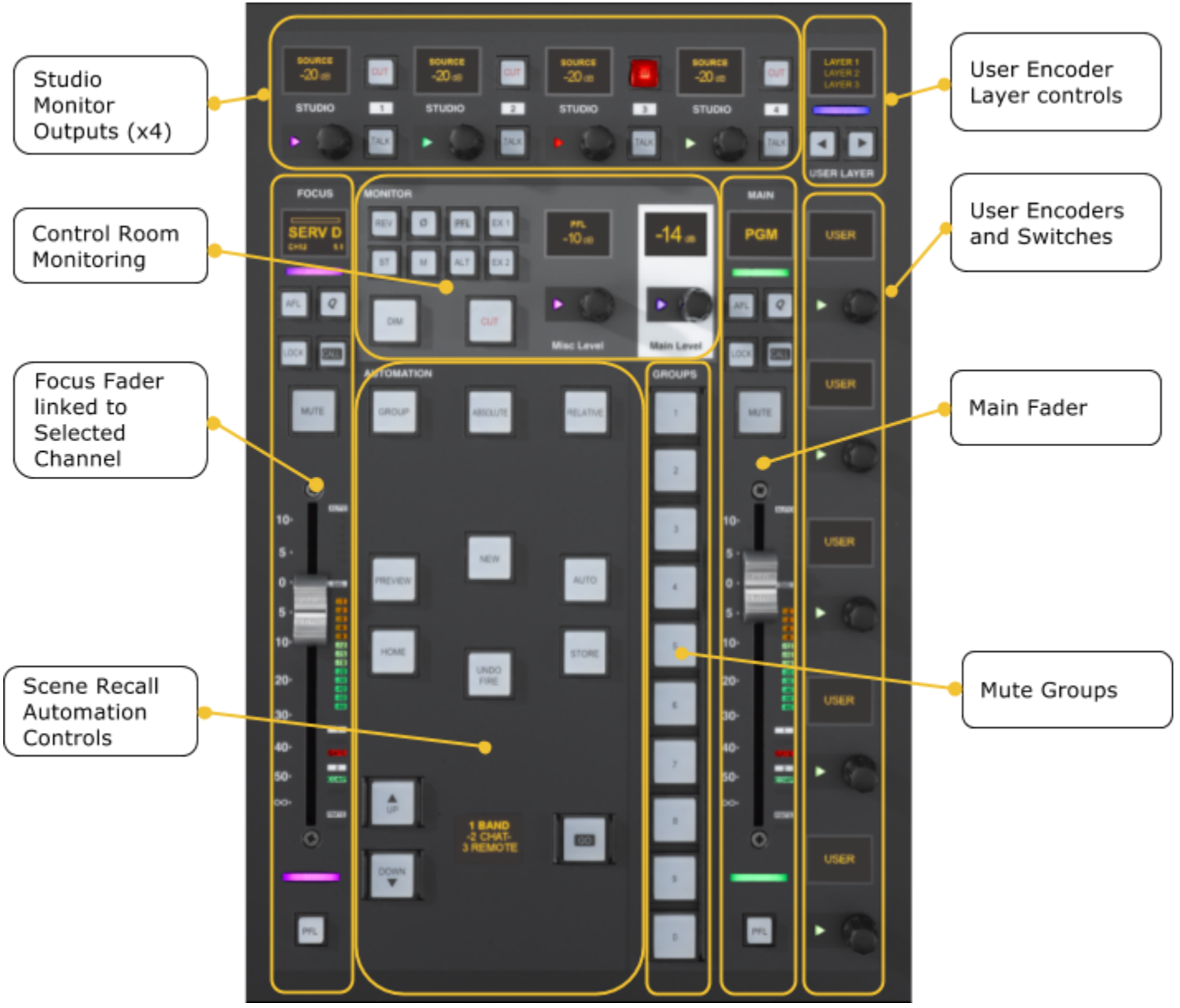
Note: If you mute a channel locally (using its own Mute button), it will remain muted regardless of the status of any Mute Groups it is part of, as indicated by the button going red.

Mute Group Routing is via buttons in the Channel Detail Fader view.

Focus and **Master Faders**

Full detail can be found here

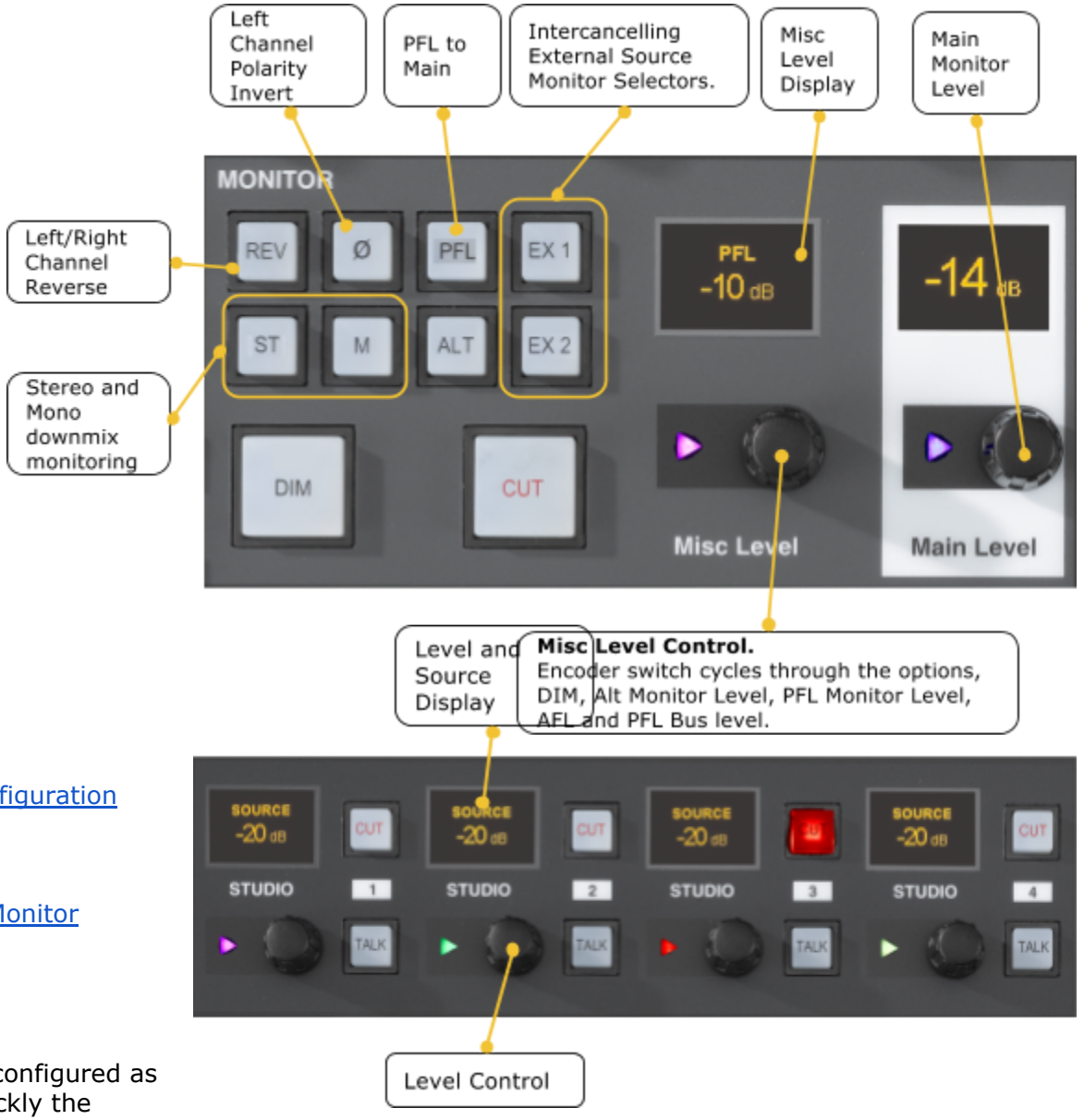
User Encoders
Functions are assigned to the five user encoders from the Setup/Options/User Menu.



Monitor

The primary controls for the console main monitor outputs.

Additional Main Monitor Control and Setup options is via the Monitor Popout in the main Channel View screen. The Small Screen controls on the Channel Tile also have an extended monitor function via the **HOME** key.



Studio Outputs

4 sets of Studio monitor outputs which can be used to feed headphones and floor monitors as well as remote production areas. The format of each output can be set in the Console Configuration menu

Additional Studio Monitor Control and Setup options is via the Monitor Popout in the main Channel View screen.

Push and hold momentary talkback buttons

Any TB function present on hardware controls is automatically configured as a momentary function for a press and hold. If you press TB quickly the function will latch, if the button is held TB will disengage when the button is released.

Channel View

The Channel View touch screen is System-T's primary control interface and provides visual feedback for a Bank of 16 channels. It is opened by selecting Channel View from the Main Screen Menu: **Menu|Channel View**

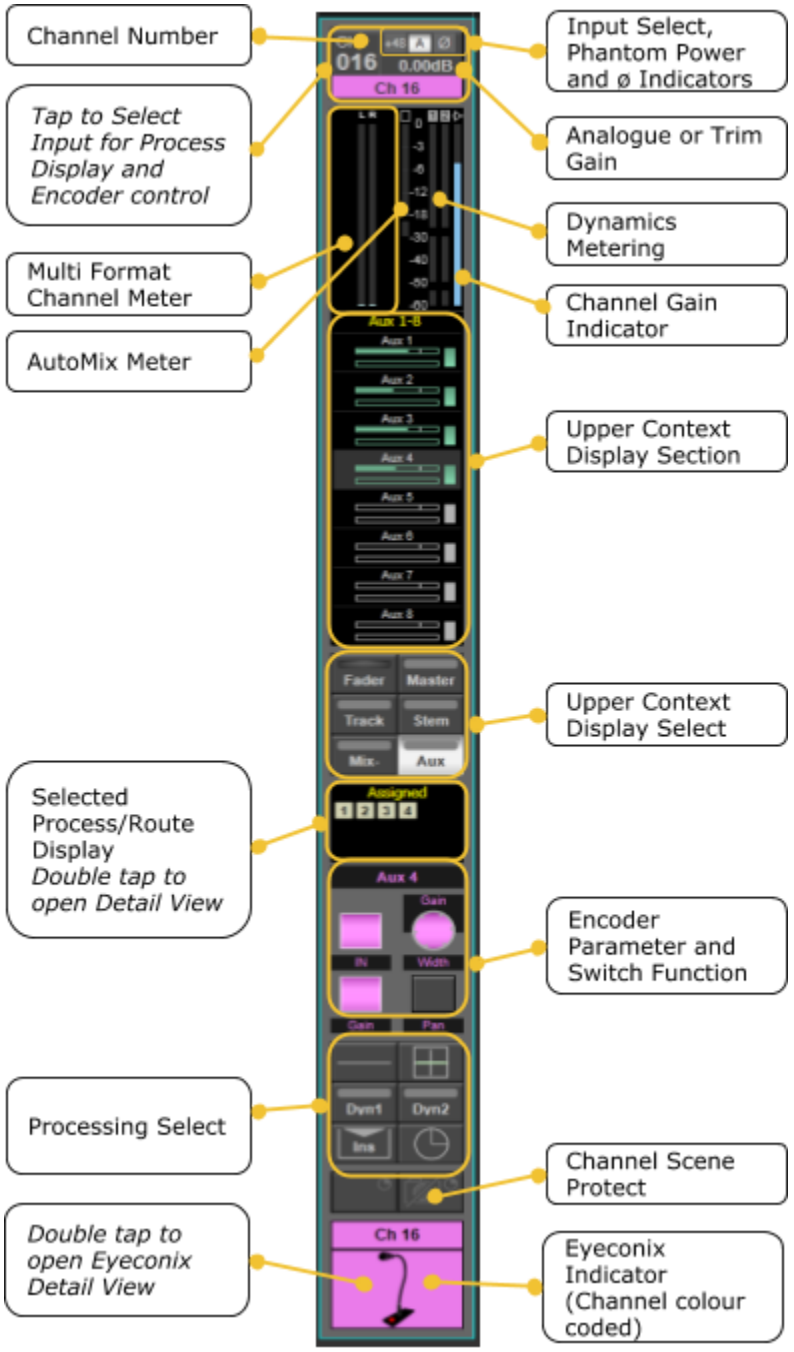
Channels of any type can be shown on the screen – Input Channels, Auxiliaries, Stems, Masters, Track and Mix Minus buses, in addition to VCA control groups.

Any of the Fader Tiles can be assigned to the Channel View screen. To assign a Tile to the screen, press that Tile's **Screen** button (above its Bank **Call** buttons).

Alternatively, use the **Layers** button on the right of the screen, to select a particular Bank of channels to the screen. (See the previous section for details on Layers and Banks.)

You can touch any channel on the screen to 'Select' it – this will also light the channel's **Select** button on the Fader Tile. The Selected channel is highlighted with a coloured frame surround.

The elements of the channel strip are shown in the illustration to the Right.



Upper Context Displays

When you make a button selection in the Upper Context Display Select area, the display area above the buttons changes to show the detail of the selection you have made. There are sIx options, Faders, Master, Track, Stem, Mix- and Aux. They have the following functions.

- Faders The Path's fader level together with AFL, PFL and Mute buttons (primarily of use for screen based offline/online control). VCA assignment plus path gain on dB's.
- Master Master bus routing
- Track Track bus routing
- Stem Stem bus routing
- Mix- Mix Minus routing
- Aux Aux bus routing, level and pan

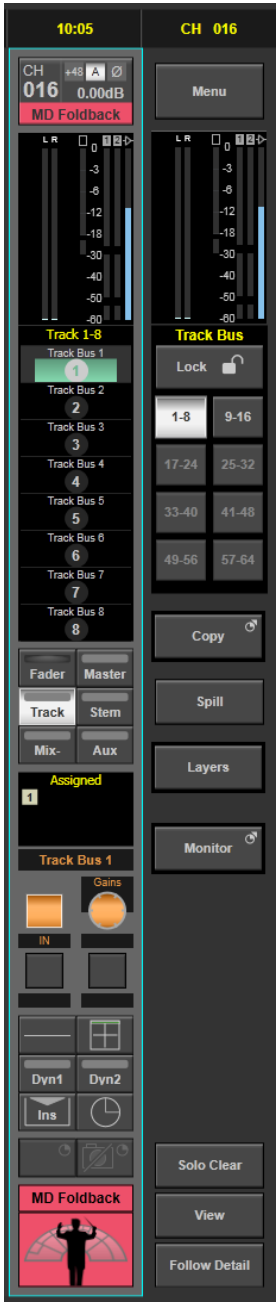
Input Select

Tapping the channel input box assigns the input functions to the Quick encoder. The Quick encoder switch cycles through Remote Gain, Input Gain and Routes with associated functions on the switches. Remote Gain and Input Gain values are shown in Input box at the top of the Strip.

Image shows Typical channel view screen with Aux mix levels and Multi-channel metering.

Image shows Typical channel view screen with Bus levels and routing.

Channel View Right Hand (Menu) Sidebar



MENU Button Expands the menu tree:

Channel View - Displays the fader tile that is selected with the tile screen button. This is where you'll spend most of your time. Screen will also call this view from any other menu.

Setup - opens the console setup configuration menus:

Automation - is where scenes within the showfile are managed.

Overview - Shows a large scale either input paths or output paths. This display is also active, so paths can be selected and adjusted with either the touchscreen or an attached mouse.

Effects - displays the rack of insert effects.

COPY - Opens the Copy and Multi-copy selector to copy the selected path settings.

SPILL - Spills multi-channel paths over adjacent path displays to allow adjustment of individual path settings.

LAYERS - The Layer Menu allows the selection of either System or User layers to the adjacent display. and associated faders.

Monitor - Menu button to display up the Monitor Pop out menu.

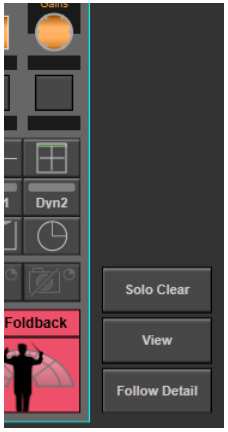
Solo Clear - Indicates if there is a Solo active anywhere. Touching the button clears any active Solo. This applies to AFL, PFL and Misc Solo's. In Dual user mode, user 1's button clears anything feeding AFL1 or PFL1, and user 2's button clears anything feeding AFL2 or PFL2. If any Solo-In-Place is active, then this is also cleared when a Solo Clear button is pressed.

View - Calls up the View Path displays.

Follow Detail - Changes the function of the row of encoders below the touch screen.

Channel Strip Detail

Path Routing Overview



The **View** key is located in the bottom left area of the sidebar and calls up the Routing overview which displays all current path bus routing. The View key inter-cancels with the rest of the routing/processing access buttons.

The routing overview shows the numbers of the assigned busses. In the case of the Mix Minus busses on Channel Paths, it is the mixes that the path has been excluded from that are shown (indicated with a line through the bus number).

If more buses have been assigned (excluded) so that they overflow the allotted area, this is indicated by an arrow to the right of the bus name. Swiping the arrow displays the additional busses. Max number of displayed routes are Master = 6, Stem = 12, Aux = 24, Mix Minus = 6, and Track = 24.

Fader Selection

VCA assignment is shown on the upper context display. If the fader has been assigned to multiple VCA in additive mode (which allows Paths to have more than one master), then a + symbol is displayed after the number of VCA initially assigned to the fader.

The path fader bar is greyed out if the path mute is active and the path gain bar greyed out if a VCA mute is active.

Path Direct Output Local Mute (with GPI control)

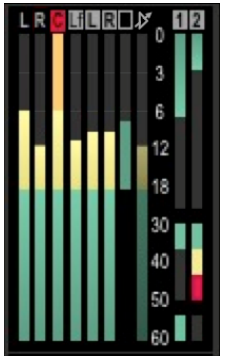
A "output mute" function is available on every direct path output. There are 2 modes that can be selected by pressing and holding the output Mute button in the channel detail input page.

- Mode 1: **Local** - The button functions as a Channel Output MUTE key and can be controlled via a GPI (it does not follow the state of the channel mute)
  - Red when muted via this switch or via GPI
  - Yellow when muted via the fader state functions (PreF Mute On: Fader Off & PreF Mute On: Fader On)
  - Grey when unmuted
- Mode 2: **Follow** - The button functions as a Channel Output MUTE key and can be controlled via a GPI plus also follows the State of the Channel Mute.
  - Orange when muted via channel mute
  - Red when muted via this switch or GPI
  - Yellow when muted via the fader state functions (PreF Mute On: Fader Off & PreF Mute On: Fader On)

Grey when unmuted

The "Output Mute" function is also a path function in the events manager.

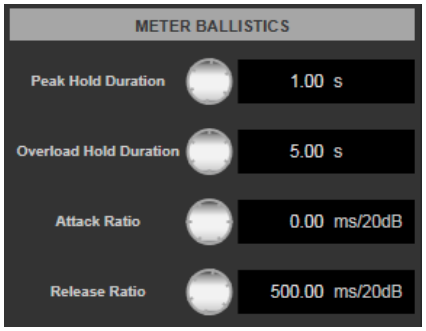
Path Meter



The path meter has an dynamic range of 60 dB. It also features two colour changes, from lower to mid at -18dB green to yellow, and from mid to upper at -9dB yellow to orange.

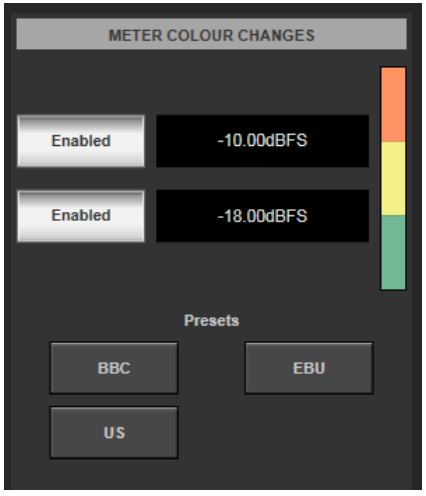
The meter also incorporates:

- Dynamics meters as a kick down for the Compressor/De-esser and Traffic lights for the gates. The dynamics meters are tricoloured drop down bars, green from 0 to 6dB, orange between 6-12dB and red above 12dB of gain reduction.
- Indicators for Dyn 1 and 2 when the de-ess mode is active. The gate indicators are dark when the de-ess mode is active.
- Automix gain display with an 18dB window plus the threshold indicator.
- Full length bargraph showing actual path gain in terms of the sum of the path fader plus any assigned VCA. Bargraph 'greys out' if the mute is active, either locally or via a VCA.



The meter ballistics can be set from the Setup/Options/Path menu as well as the overload and peak hold indicator duration.

Changeable Meter Colour Breaks



The colour breaks on all the metering can be user configured, this is a global setting found in the **Setup, Options, Meters** page. Default settings can recalled from the Preset buttons or the dB value at which metering changes from yellow to orange and from green to yellow can be entered via the touch screen keyboard. In addition the orange and yellow sections can be enabled or disabled.

Channel 'Detail View'

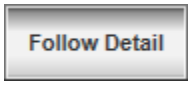
The channel detail 'View' is used for accessing a more detailed configuration of the channel than is available using the quick controls.

Detail Views replace the lower half of the Main Channel View screen with a dialogue is specific to the channel which has been 'Selected' (either by pressing the channel's Select button in the Fader Tile or by touching the channel in the Channel View screen).

To open the channel detail dialogue, double tap on the channel Quick Display or in the Eyeconix Area.

The detail dialogue will open in the lower half of the main screen. It will open on the page which is relevant to the contents of the Quick Display if was double-tapped, otherwise to the Input or Eyeconix detail views.

The elements displayed within the page can be adjusted by pressing or dragging on the touchscreen. The precise operation of each 'detail view' screen is described in the following Channel detail pages of the Channel section of this manual.



The quick controls beneath the screen can also be assigned to the Detail dialogue parameters. This requires the **Follow Detail** button (bottom right corner of the Main Screen) to be activated. Touch the button to toggle between:

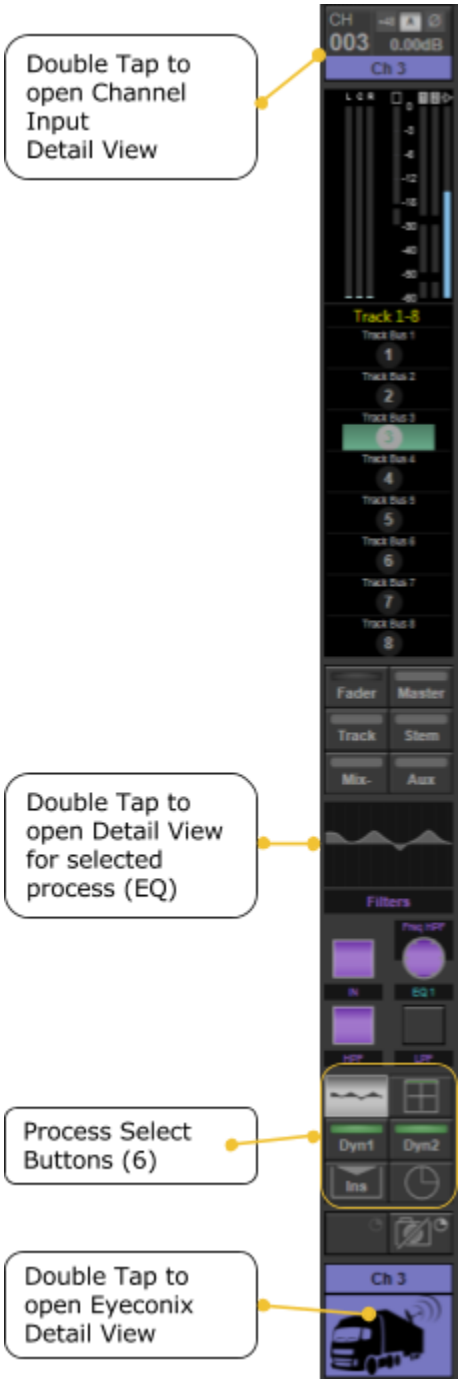
Follow Channel (button inactive); the quick controls below the screen follow the selected function, as per the quick controls on the other Fader Tiles.

Follow Detail (button active); the quick controls below the screen are assigned to different functions for the selected channel. Only applicable when the Detail page is open. The quick controls on other Fader Tiles are unaffected.

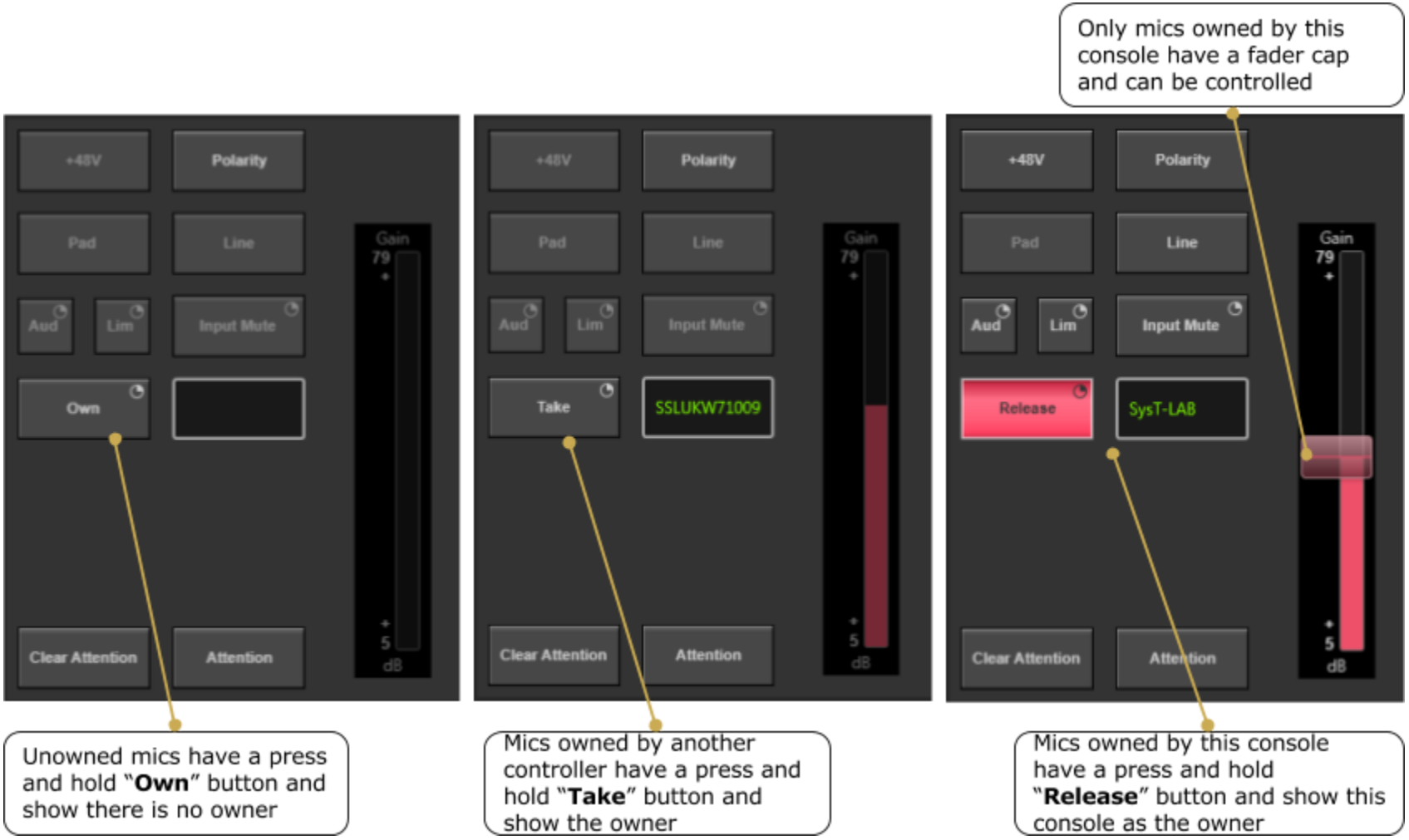
The labels across the bottom of the Detail dialogue indicate the functions assigned to the quick controls directly beneath them. Only one function is assigned to each Channel's quick controls. Switch functions are assigned to the Upper Quick Key (which will be lit if available) and continuous parameters are assigned to the Encoder.

The on-screen encoder labels show an indication of whether it is the Encoder or the Upper switch that is controlling the labelled function. For example:

The left parameter is controlled by a switch (square symbol in top LH corner). The right hand parameter is controlled by an encoder.



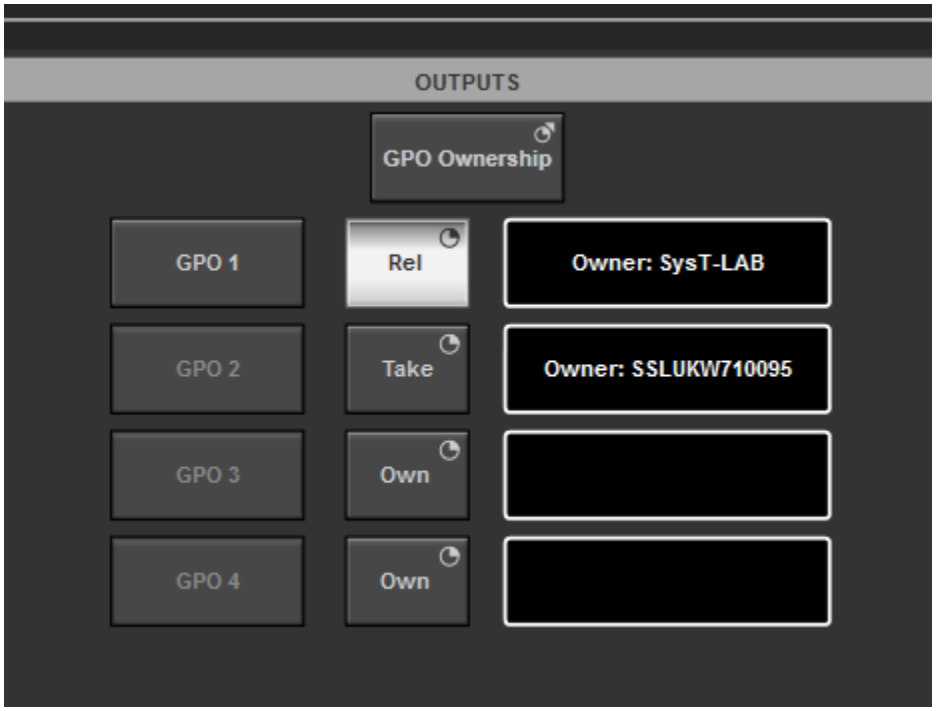
SB 8.8 and SB i16 mic gain ownership



Mic pre parameters have a concept of ownership, the ownership concepts applies to all SSL control instances of the SB 8.8 and SB i16. (In this case both the System T control surface and the Network IO Controller App.) Ownership includes the Mic gain, the Mic/Line switching, controlling the PAD and input mute, plus the Audition and Limiter features.
If a Mic is not owned and it is routed to a console, the console will automatically take ownership. If a Mic is owned by a different controller routing will not automatically take ownership, if required "take" ownership will need to be performed.

Note: Ownership of Mics is stored on the IO device itself and not part of the showfile, when loading a showfile the routing of the Mic pre will automatically own the controls if the Mic is not owned by any controller.

GPOs on SBi16 and SB8.8 are also ownable, ownership of particular GPIOs is stored on the device rather than in the consoles showfile. The ownership of GPIOs is managed in the
Setup / **I/O Setup** / **Physical Device Configuration** tab.



Note: You will need to take ownership of any GPOs that have been routed to in events manager during the update process.

SB 8.8 and SB i16 mic audition mode

Audition automatically reduces the mic gain so the stagebox network transmit signal is at a nominal -15dBFS. Audition can be engaged from any owning control interface. Audition only reduces gain, therefore to automatically set the mic gain for low level signals the mic gain will need to be increased before audition is engaged.

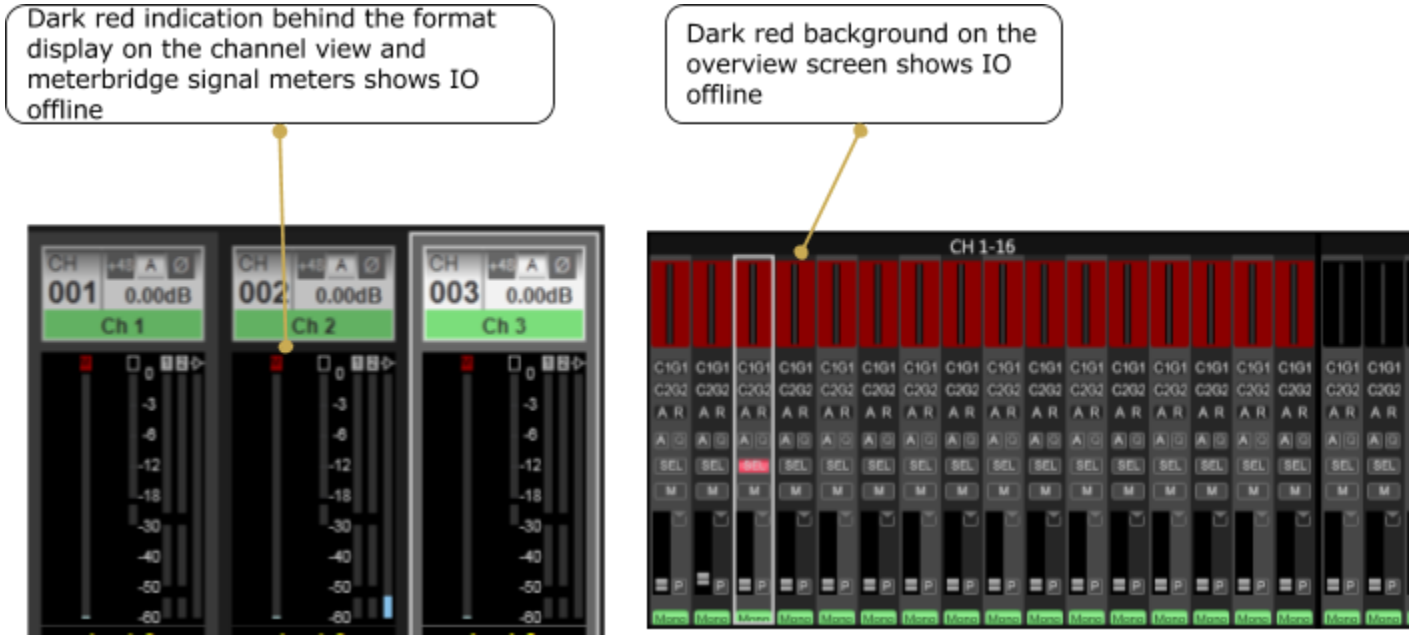
Note: The console GUI currently has Audition as a latching press and hold button, this will change to a momentary button press in a subsequent release. (to match the momentary button in the Network IO Controller App)

SB 8.8 and SB i16 limiter

SSL's Superanalogue™ and high resolution digital mic gain control technology have been combined to provide a software limiter circuit that significantly reduces digital clipping artifacts when the output of the mic preamp approaches 0dBFS due to unexpected signal peaks that can often occur in a live broadcast environment. An oversampled DSP based feed forward limiter reduces the mic pre gain as soon as the output level exceeds a peak average level of -3dBFS.

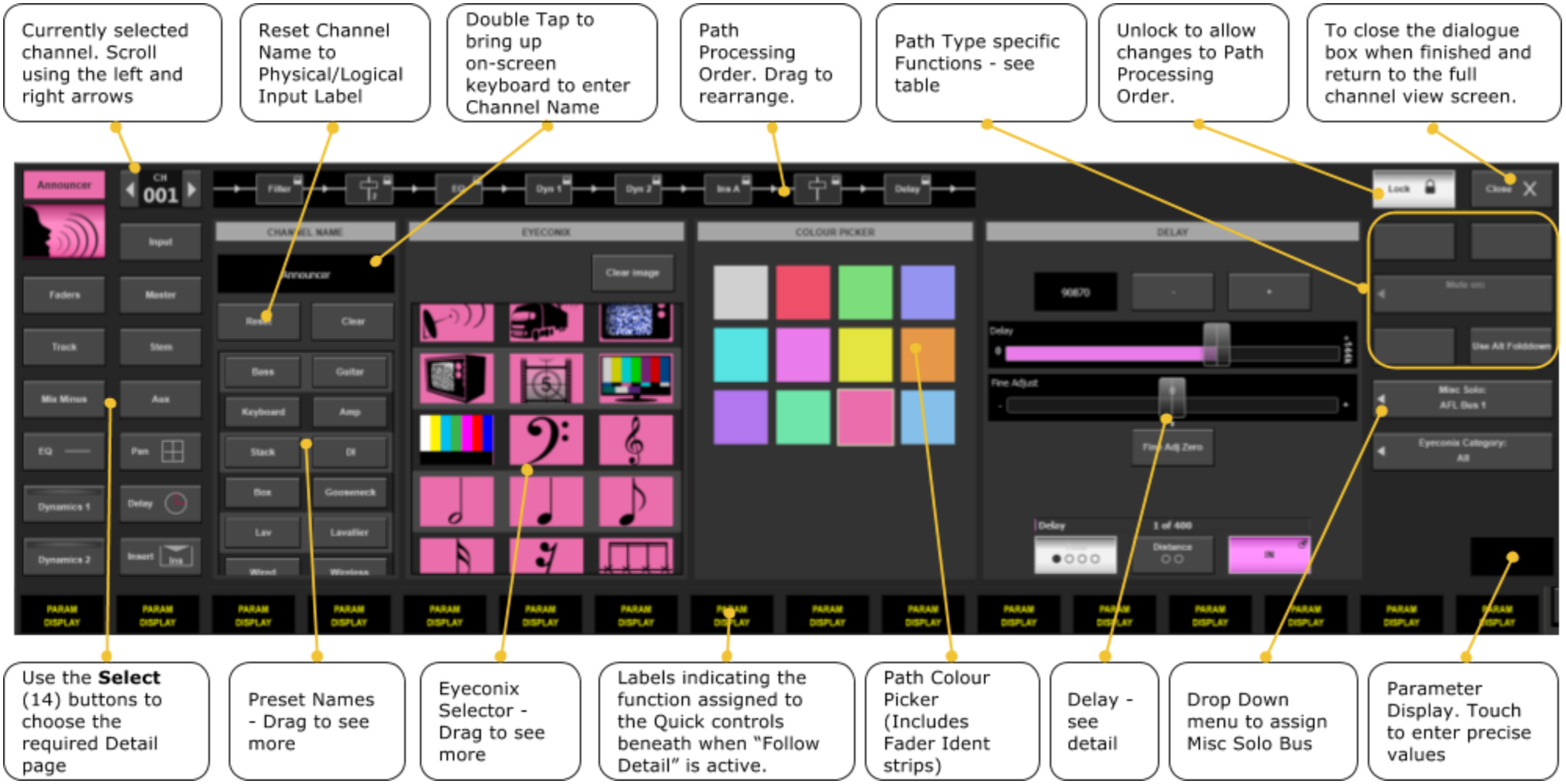
Offline IO indication

Devices that are offline on the network show an offline status in the channel paths they are routed to.


Dark red indication behind the format display on the channel view and meterbridge signal meters shows IO offline
Dark red background on the overview screen shows IO offline
CH 001 0.00dB Ch 1
CH 002 0.00dB Ch 2
CH 003 0.00dB Ch 3
CH 1-16

Eyeconix 'Detail View'

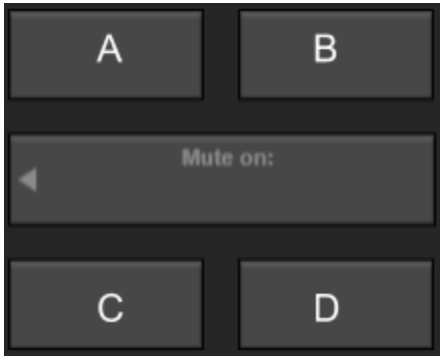
The Eyeconix detail 'View' is used for accessing the detailed configuration of the channel. The Delay section controls are located in this detail view.


Currently selected channel. Scroll using the left and right arrows
Reset Channel Name to Physical/Logical Input Label
Double Tap to bring up on-screen keyboard to enter Channel Name
Path Processing Order. Drag to rearrange.
Path Type specific Functions - see table
Unlock to allow changes to Path Processing Order.
To close the dialogue box when finished and return to the full channel view screen.
Use the **Select** (14) buttons to choose the required Detail page
Preset Names - Drag to see more
Eyeconix Selector - Drag to see more
Labels indicating the function assigned to the Quick controls beneath when "Follow Detail" is active.
Path Colour Picker (Includes Fader Ident strips)
Delay - see detail
Drop Down menu to assign Misc Solo Bus
Parameter Display. Touch to enter precise values

Path Setup Function Buttons

The 5 option buttons have the following function according to channel path type. For Track Buses, Mix Minus and Masters, these are blank. For buses these options determine the behaviour of channels or stems routed to the bus.

	Option Buttons				
Path Type	A	B	Mute on:	C	D
Channel	-	-	Mute on:	-	Use Alt Foldown
Stem	-	-	Mute on:	Auto Mix Minus Channel Remove	Use Alt Foldown
Aux	Follow Pan	Follow Mute	Mute on:	-	-



Use Alt Foldown (Channels and Stems) Determines whether a 5.1 Channel or a 5.1 Stem routed to Stereo or Mono bus, or a Stereo Channel or Stem routed to a Mono bus uses the Default or Alternative Folddown Coefficients from the Setup/Option/Path menu.

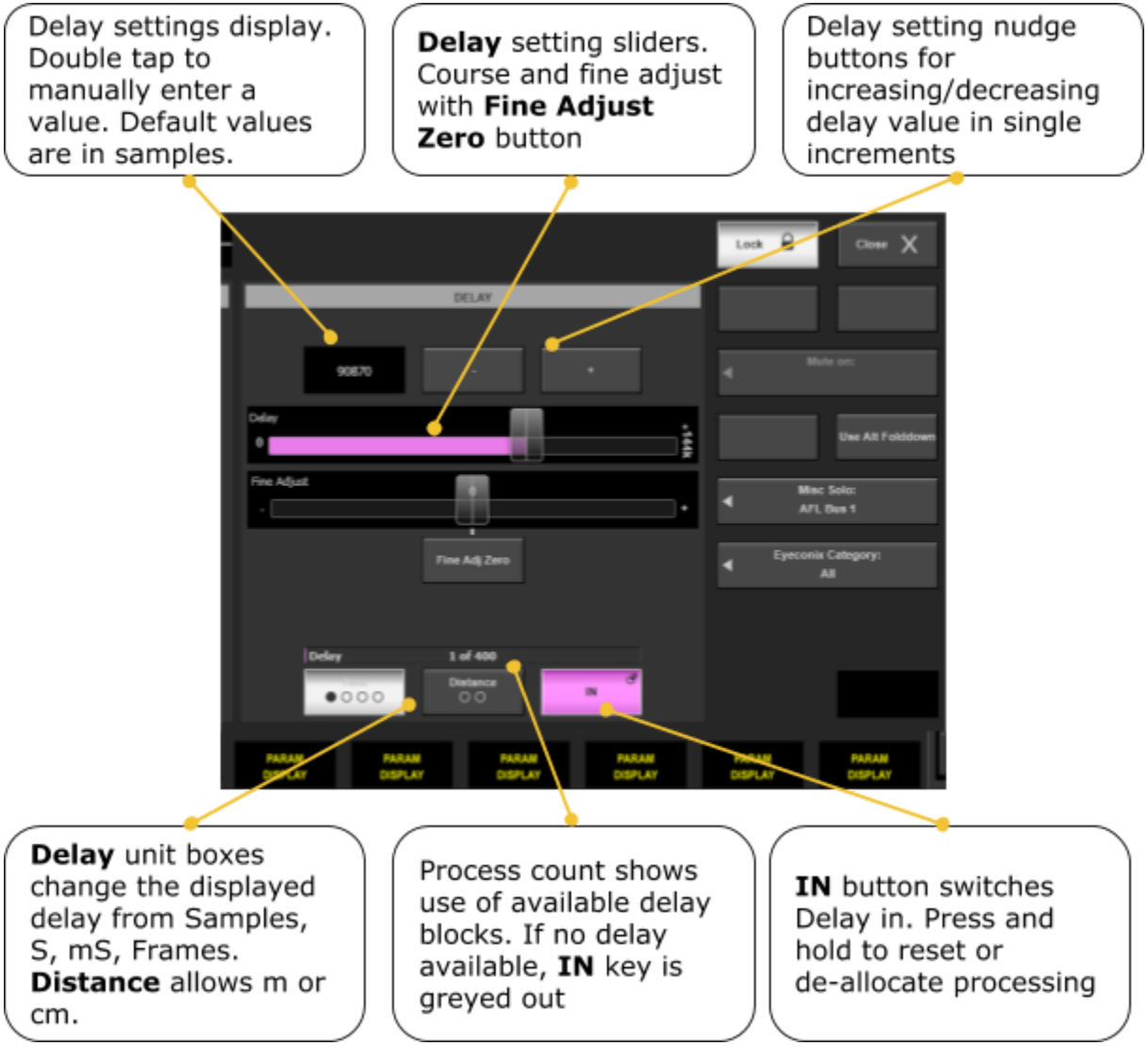
Auto Mix Minus Channel Remove (Stems) When activated automatically removes any Channels routed to the Stem from mix minus buses that the stem has itself been routed to. This prevents any artifacts caused by channels reaching a stem via two paths occurring.

Follow Pan (Auxes) Determines whether channels feeding a stereo or above formatted aux bus follow the main channel pan or can be panned individually via the Aux pan pots.

Follow Mute (Auxes) Controls whether Aux send is muted when the channel is muted or remains active.

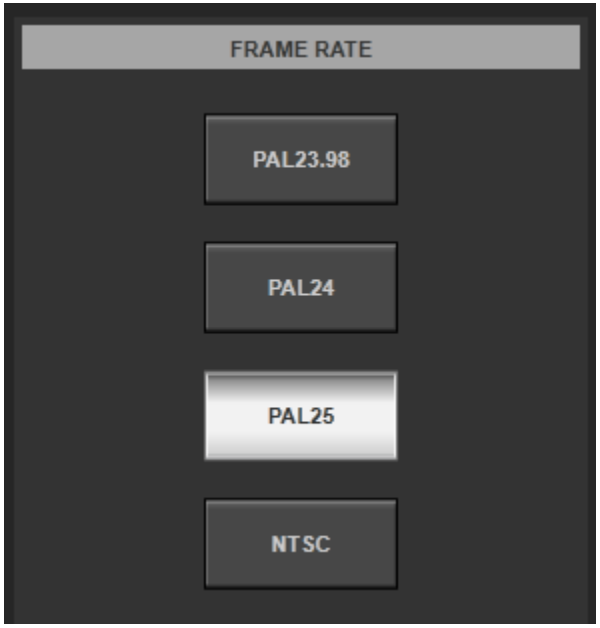
Mute On: (Auxes) A drop down menu offers three choices for how Pre Fader Aux sends are linked to the Channel ON state (Channel ON = Fader Open and Mute OFF). The options are:
None
Pre Fader Mute on Fader OFF
Pre Fader Mute on Fader ON

Delay

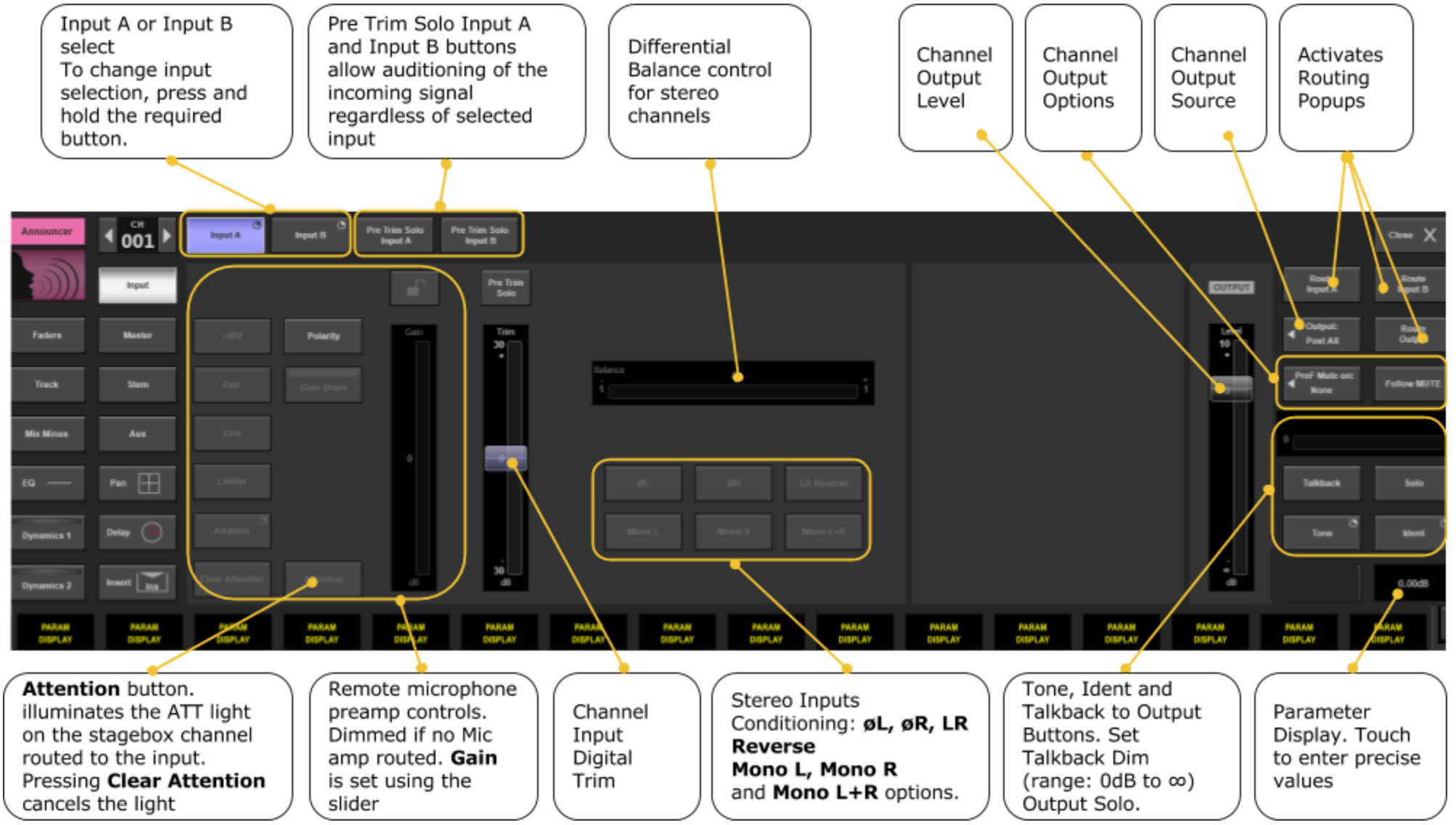

Delay settings display. Double tap to manually enter a value. Default values are in samples.
Delay setting sliders. Course and fine adjust with **Fine Adjust Zero** button
Delay setting nudge buttons for increasing/decreasing delay value in single increments
Lock
Close
DELAY
90870
Delay
Fine Adjust
Fine Adj Zero
Mute on:
Use Alt Folddown
Misc Solo:
AFL Bus 1
Eyeconix Category:
All
Delay
1 of 400
Distance
IN
Delay unit boxes change the displayed delay from Samples, S, mS, Frames. **Distance** allows m or cm.
Process count shows use of available delay blocks. If no delay available, **IN** key is greyed out
IN button switches Delay in. Press and hold to reset or de-allocate processing

Frame rate for Delay values in frames

In the **Setup**/**Options**/**System** tab, frame rates can be selected to ensure the frames option in the delay parameters corresponds to the correct time value.



Input/Output Detail View
(Mono and Stereo Input Channel shown)


Input A or Input B select
To change input selection, press and hold the required button.
Pre Trim Solo Input A and Input B buttons allow auditioning of the incoming signal regardless of selected input
Differential Balance control for stereo channels
Channel Output Level
Channel Output Options
Channel Output Source
Activates Routing Popups
Attention button. illuminates the ATT light on the stagebox channel routed to the input. Pressing Clear Attention cancels the light
Remote microphone preamp controls. Dimmed if no Mic amp routed. Gain is set using the slider
Channel Input Digital Trim
Stereo Inputs Conditioning: øL, øR, LR Reverse Mono L, Mono R and Mono L+R options.
Tone, Ident and Talkback to Output Buttons. Set Talkback Dim (range: 0dB to ∞) Output Solo.
Parameter Display. Touch to enter precise values

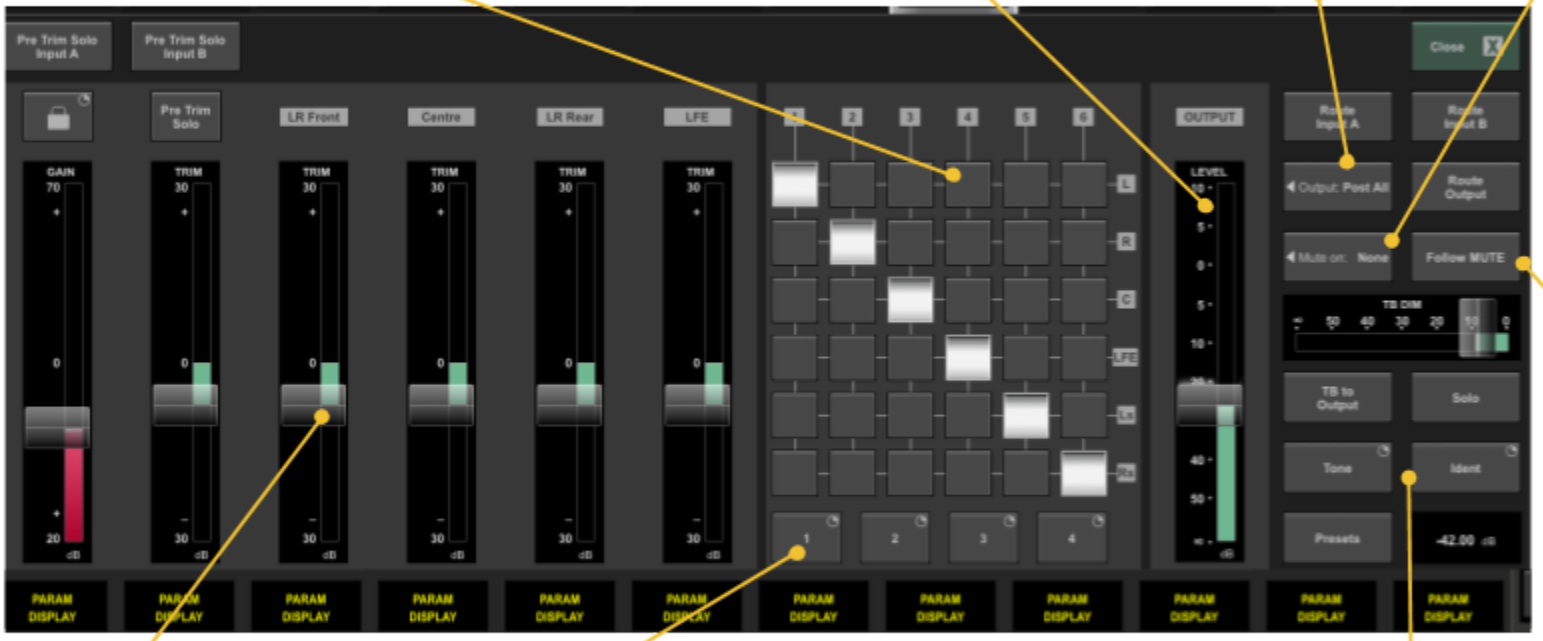
Input/Output Detail View (LCR and above Input Channels)

For paths with LCR formats and above an input re-assign matrix is added. Incoming sources can be easily reassigned in case they are in a different format e.g, L C R Ls Rs LFE format. Sources can not be summed but they can be routed to multiple inputs. This allows two channel material to be assigned to Centre and to Left+Right.

The **Output** fader controls the output level, default is unity (0dB).

The **Output** button selects the Output path pick off point, the options are Path Output (Post All), Pre Fader, Pre EQ, and Post Input Trim.

The **PreF Mute** on: button selects the path state that will mute the Path output when sourced from a pre fader pick off point. The options are None, Path On and Path Off. These options are all mutually exclusive.



The **Follow MUTE** button determines if the Path output follows the Path MUTE state.

Stereo and Mono gain trim controls for multichannel inputs.

Four preset stores are available. These initialise with the standard 1:1 routing saved. Press and hold the Store Button to save the current routing into a Preset. Presets are recalled directly from the store buttons.

Tone, Ident and Talkback to the Path Output. Tone and Ident inter cancel and are press & hold functions to avoid inadvertent operation. The Solo Key routes the current path output signal to Misc Solo bus. TB to Output adds the console Talkback bus to the Path output whilst applying the TB Dim value to the main path output signal - note that the dim value can be set to OFF (∞) so that talkback can replace the path output signal.

Pan/Master/Stem Detail View

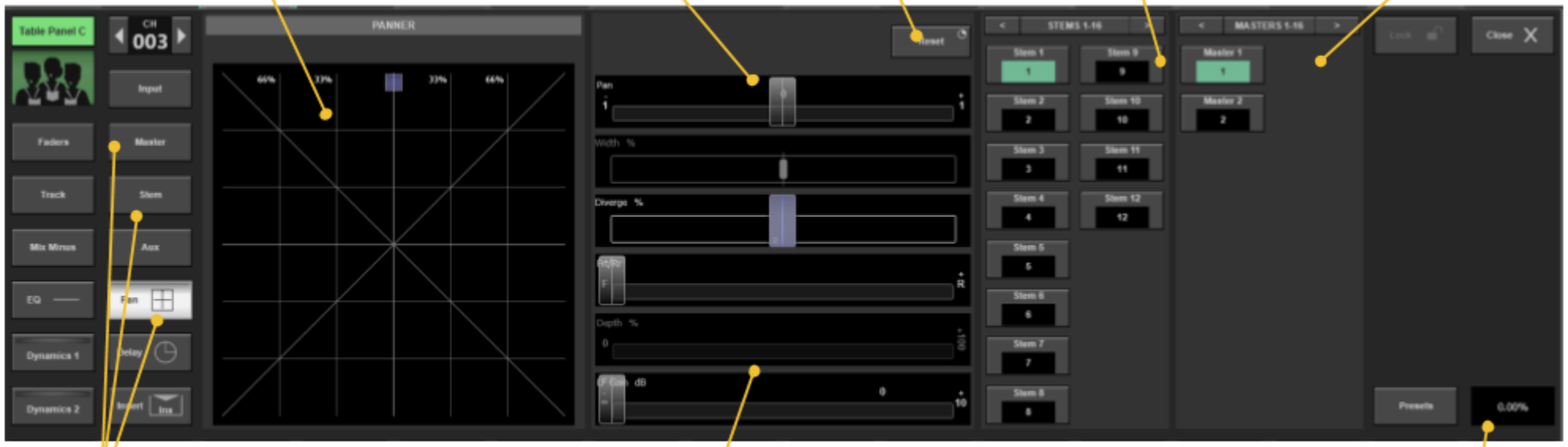
Graph represents the pannable area, with the coloured square indicating where the audio is placed in space. Drag the square around the graph to pan the signal around the space.
Pinch the graph area to adjust the width of the signal (not applicable to mono channels).
The arrows at the edge of the blue area will be coloured red if the width has been inverted (L-R swap) or green if not inverted.

Sliders for all relevant pan parameters
Touch and Drag the sliders using the touchscreen to adjust, or use the encoders below the screen in Follow Detail mode.

Press and hold **Reset** button to reset Pan parameters

Stem section shows routing of the channel to the **Stem** buses. Press the **Stem 'n'** buttons to route.

Master section shows routing of the channel to the **Master** buses. Press the **Master 'n'** buttons to route.



Select **Pan, Stem** or **Master** to open this Detail View page.

The parameters available depends on the formats of the channel and the bus being routed to.
To pan a stereo channel, first reduce the **Width** of the signal in order to pan around the stereo space.
To pan a surround channel front/back, first reduce the **Depth** of the signal.

Parameter Display. Touch to enter precise values

Aux/Mix Minus/Track Detail View

Aux buttons are either in 'select' or ON/OFF mode, depending on the status of the **Lock** button on the right hand side of the display. **Lock**ed means 'select' for accessing the Level and Panning controls
Unlocked means ON/OFF. For Touch Screen Routing

Bus Group Select. The Arrow keys select bus pages

The level and panning controls follow the last bus group selection. I.e. Aux, Mix Minus or Track Bus.

The **Feed** menu applies to individual auxes if the aux bus routing is active, but determines the pick off point for all assigned track or mix minus buses. The options are Default, Post All (i.e. Path output), Pre Fader and Pre EQ. The Default option is set via the Console configuration page in the Setup menu.

Select **Aux, Mix Minus** or **Track** to open this Detail View page.

The Green square indicates Aux ON and the Pre/Post status. Button Right is Post and Button left Pre. Top Green Bar shows the Aux Level. Lower bar indicates Pan for Stereo Auxes

On Channel Paths the Mix Minus bus crosspoints default to active, and the routing keys remove sources from the mix. If a Channel has been removed from the Mix Minus bus because it has been routed to a Stem that is already feeding a Mix Minus bus which has the Auto Mix Minus Channel Remove function enabled, then the bus routing key has no action.

The Track buses and Mix Minus buses have single shared level and pan control for the selected buses. Whether Track and Mix Minus buses follow the main Channel or Stem panning or have local pan controls is determined by the **Mix Minus Local Pan** or **Track Bus Local Pan** buttons (these are per source chan/bus and affect feeds from that source on to all track busses or all mix minus busses).

Fader/MG/VCA/2nd Gain Detail View

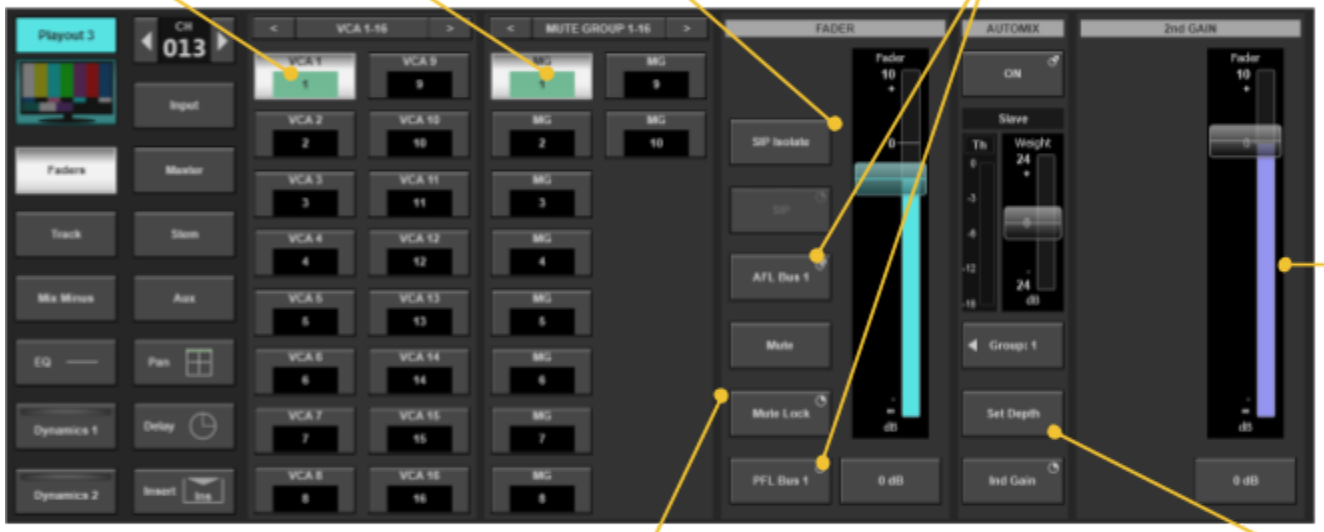
Fader controls, VCA and Mute group assignment, AutoMix and Path Secondary Gain Stage are accessed via this Detail View.

32 **VCA** groups assigned to any channel or output path via the VCA select keys.

10 **Mute Groups** assigned to any channel or output path via the **Mute Group** select keys.

Path Fader includes a Solo In Place (if Active) and SIP Isolate key **0 dB** sets the Path fader to 0dB.

The **AFL** and **PFL** keys have push and hold menus to select the respective AFL/PFL 1 or 2 bus option (this is an either/or option for bus 1/bus 2; it can't be set to neither or to both).

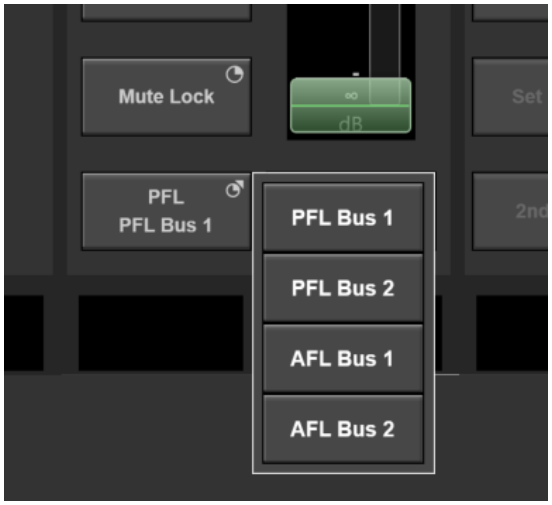


The second gain fader controls the path independent gain stage. The primary purpose of this is to allow automix to control pre-fader sends as well as post fader sends and, for external level control applications, to retain the main path fader as an overall trim on the gain set by the external controller. The second gain fader defaults to 0dB (whereas the primary fader defaults to Off), so that audio always passes when the user opens the primary path fader.

Mute Lock Button has a push and hold function to disable/enable the **Mute** key function (primarily required for Master Faders which default to locked). When mute is Locked, the Path's mute switch has no effect and is locked in the locally un-muted state. Assigned VCAs and Mute Groups can still trigger the mute, however, as can scene recall or presets (and, as scenes and presets affect the local function state rather than applying a group master offset, they can leave the mute locked in the locally muted state). A VCA can, of course, have its own mute switch disabled as any other Path. Paths with the Mute function will have their fader panel Mute keys unlit to indicate that they have no function although they will still light if muted by an external scene recall, Mute group or VCA master mute, or Event.

Automix functions are detailed in the next section (read on!)

PFL to AFL bus option



This option provides the ability to have the path PFL buttons feed either of the AFL busses allowing AFL bus 2 to be used as a third PFL bus in a multiuser configuration. This can be decided on a path by path basis in the **channel detail, fader** page.

Automix

Automix is available on all Paths except VCA's regardless of Path Format. On 2.0 and above formatted channel paths a mono downmix that is used for the automix gain calculation. A maximum of 400 paths can be processed by the Automix system.

The Automix algorithm focuses channel path gain on the dominant source in the automix group by automatically reducing the path gain of the other group members. In a typical multi mic setup this eliminates open mic crosstalk and maintains a constant ambient noise floor avoiding back ground pumping artifacts that would occur if gates or expanders were used. When there are multiple dominant sources the overall gain of all the contributing sources is reduced to maintain a constant overall volume level. The Automix gain reduction is indicated by a meter next to fader and is also shown on touch screen path meter and on the optional meter bridge. The meter bar indicates the applied automix gain, in reality it indicates attenuation as the top of the bar is unity (0dB). Below the bar is an indicator that illuminates when the path signal is above the minimum threshold for the automix algorithm to function. On Channels receiving Mic inputs then this should be on when the mic is picking up ambient studio noise.

System T has 8 independent Automix groups. When paths are assigned to groups an additional option exists to assign the path as a Slave. With the Slave mode active, the assigned path control element receives Automix gain control values derived from paths in the Group not enabled as Slaves. Slaves paths are still automixed relative to each other but are 'ducked' by any active Path not in Slave mode. *Note that the Weight control remains active on Slave Channels and still controls the slave channel mix contribution as described below. There is additional Group Slave Depth control that increases or decreases the ducking effect, if the desired result can not be achieved via the Weight control.*

ON activates the Automix Function. It has a push 'n hold option with a pop out menu to select the Slave mode, reset the Automix Weight and Depth controls and to deallocate the processing. Selecting the Slave mode will illuminate the SLAVE mode indicator located beneath the ON button.

The Automix **Group** button calls up a drop down menu to select an Automix group. Default is Group 1. There are 8 Automix Groups.

The **Weight** slider has a Range of ±24dB. This determines the dominance of that channel path in the automix group mix. Increasing the weight allows the path to dominate any other active paths so that a presenter can talk over the guests in a talk show setup. Decreasing the weight means that the path will contribute less to the mix when not active, i.e. any crosstalk pickup from that source will be attenuated more than pickup from the other paths. If only one path is active then the weight control setting on the active path has no action. Next to the Weight control is the Automix gain reduction meter and Threshold indicator. It indicates when the incoming signal is above the minimum automix signal threshold.

The **Set Depth** controls changes the Weight Slider into a Depth Slider for the current Automix Group. This modifies the amount of automix attenuation applied to the slave paths in the group, i.e. the amount of ducking. The control has a range of ±40dB. There is a single Group depth control setting but it can be accessed from any master or slave path assigned to that Automix Group.

By default the Main Path Fader receives the level control data when Automix is enabled. The menu button at the base of the automix block selects the Ind (Independent Secondary Gain) fader as the automix control element. It has a push 'n hold action to avoid inadvertent operation. Note that the Automix control is added to the current value of the Path Gain control element similar to a VCA group control signal, ie the Path Gain control doesn't physically move to reflect the automix contribution.

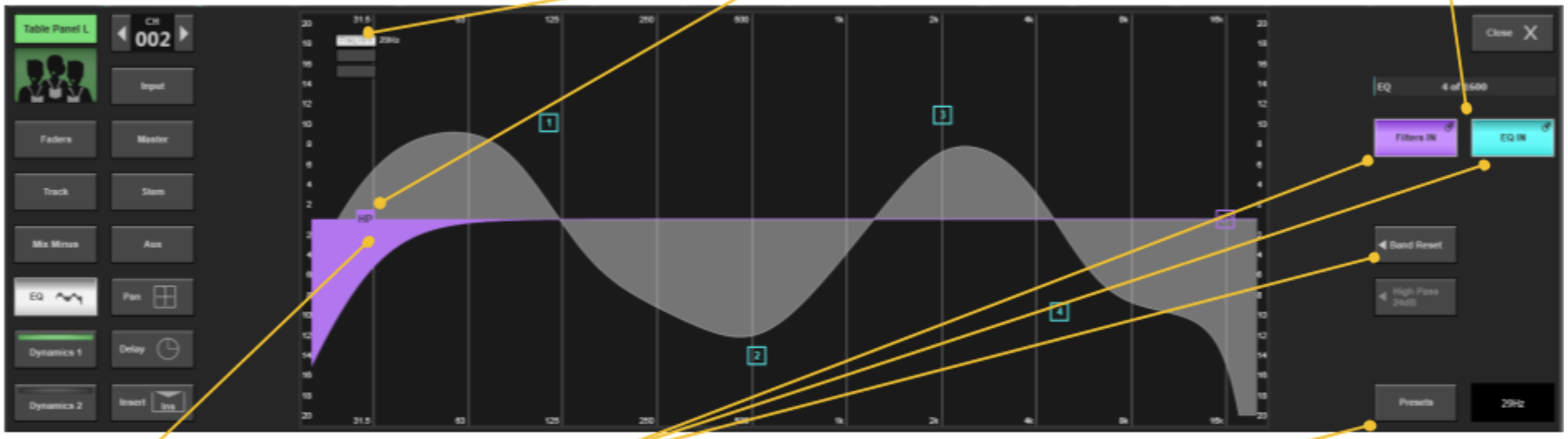
There is an Automix Setup Pane in the **Menu|Setup|Option|Path** menu. For each Automix group the gain reduction time constants can be entered, the defaults however should work for most situations. Additionally options can be enabled to automatically remove a path's contribution to the assigned group's automix processor when either path fader is closed or the path is muted. The Group current Slave depth value is also displayed and can be adjusted if required.

EQ Detail View

The Detail dialogue's EQ graph provides a very precise display of the frequency response of the EQ and filters, both as individual bands and as in the overall effect.

To Manually Enter EQ Values
Select the the node of the required EQ or Filter Band. The current parameters for frequency, gain and Q, are shown in the three boxes at the top left of the corner of the graph.
Select the required value box. It will be highlighted and the current value will now be shown in the Data Entry box next to the Preset button.
Double tap the box to call up the on screen keyboard. Select the numeric keyboard option mode and type in the required value followed by OK.

EQ IN & **Filter IN** buttons
Push and hold to access the option to Reset the whole EQ or deallocate the processing.



You can drag the nodes within the EQ graph using a finger or the mouse button. To change the Q value, use two fingers to narrow or widen the shape of the curve.

To reset individual EQ or filter bands, press the **Band Reset** button and select the required band from the drop-down list.
To reset the entire EQ and/or filters to flat, press-and-hold the **EQ IN** or **Filter IN** button and select the Reset option from the drop-down list that appears.
The **EQ IN** drop down menu has a Deallocate option to allow the resource to be freed. The IN buttons are also dimmed if no EQ resource is available.

To load an EQ Preset for the channel, touch the Preset button and select a preset using the Preset selection dialogue which appears.
To save a Preset, in the top left corner of the Presets page, select EQ Bands to save the four bands of parametric EQ, Filters to save the high- and low-pass filters or EQ+Filters to save both followed by Save As.
To modify an existing preset, select it from the list then use the Save button to overwrite it with the current Eq and Filter settings.

EQ/Filter Options

Each band of EQ and filters has three shape options, which are different for each type of band.
On filter bands, these options allow you to select the filter slope between **12dB**, **18dB** or **24dB** attenuation per octave.

On EQ bands, the following shapes are available:

Band 1 (LF): **Low Shelf** (with adjustable Q allowing overshoot/undershoot at corner frequency), **ConstantQ** (where the Q is adjustable but constant as gain is changed) or **Legacy** (which emulates the Q behaviour of a typical SSL E-Series EQ).

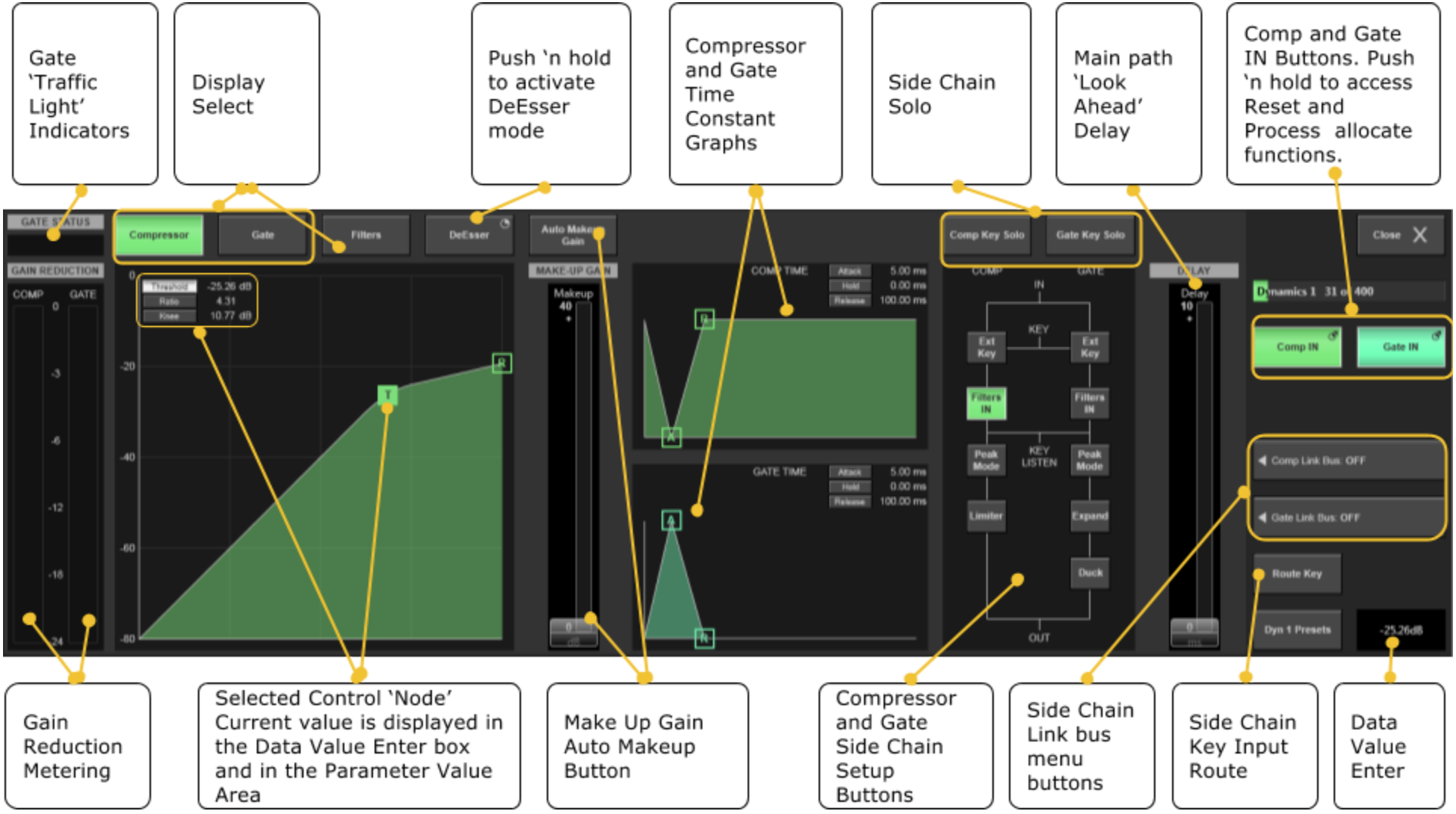
Band 2 (LMF) and Band 3 (HMF): **ConstantQ, Legacy** or **Notch** (set to maximum gain reduction at the centre frequency; Q and frequency can be adjusted in the usual way).

Band 4 (HF): **High Shelf** (with adjustable Q allowing overshoot/undershoot at corner frequency), **ConstantQ** or **Legacy**.

To change the band's shape:
Touch the relevant band's node – it will be coloured to indicate it is selected;
Touch the button to the right of the graph, below the **Band Reset** button to open a menu with the shape options and select the desired shape.

Dynamics 1 & 2 Detail View

System T Dynamics Section combines five different processes into a single dsp element. Up to two dynamics sections can be inserted into a Channel Path. The unit can function as a Compressor or Limiter together with a Gate or an Expander, or as a De-esser.



Process Overview

The compressor has two distinct modes activated by the **Peak Mode** button in the side chain option area. With **Peak Mode** OFF, the Compressor uses r.m.s level detection to determine gain reduction and is modelled on SSL's music console's channel compressor. This offers very transparent gain reduction even with relatively large amounts of compression and is ideal for controlling individual elements of a mix. With **Peak Mode** ON, the side chain is reconfigured with Peak level detection and a modified time constant section to recreate the SSL Master Bus compressor. This excels when used on complex sources such as stems and main outputs in bringing an overall cohesiveness to the elements of a mix as well as controlling the peak levels.

The **Limiter** mode activates a 'True Peak' Zero overshoot Limiter function. The side chain uses 4xFs oversampling and feed forward zero attack time topology to ensure that intersample peaks are detected resulting in a limiter that delivers a Program mix that will never exceed the **Maximum Permitted True Peak Level** set out in the EBU R128 Loudness specification. On Limiter Mode only control of the Release time is available.

The **Gate** can be switched into Expander mode by touching the **Exp** button in the Gate setup display. The expander mode has a variable knee. **Duck** inverts the **Gate** operation, i.e the gate closes when the side chain level is above the threshold. This will be shown on the gain graph.

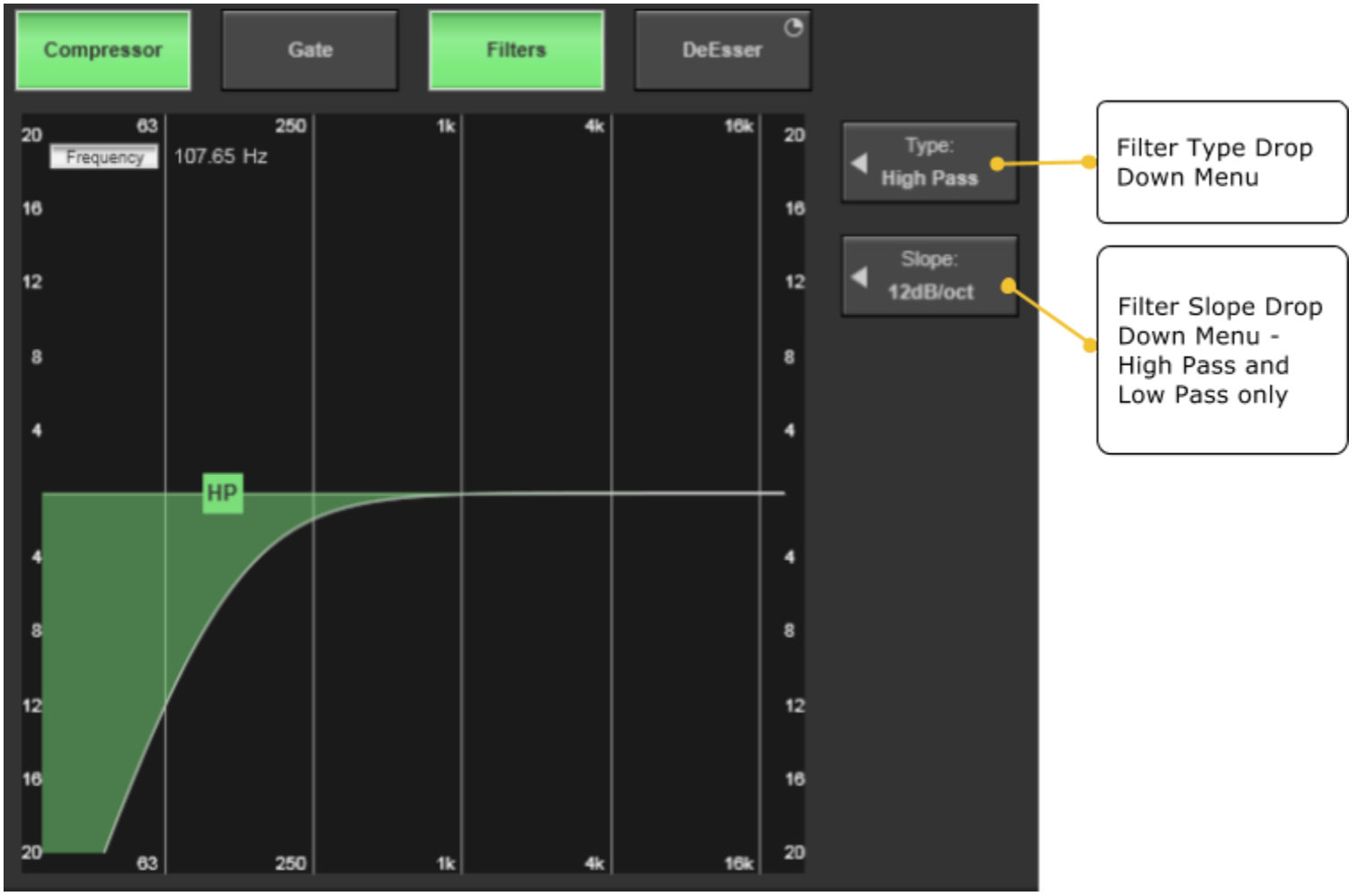
There are 32 **Compressor Link Buses** 32 **Gate Link Buses** accessible via the drop down menu buttons for each Dynamics section. Buses 1 - 32 are for Dynamics 1 and buses 33 - 64 for Dynamics 2.

Touch Screen Control Tips

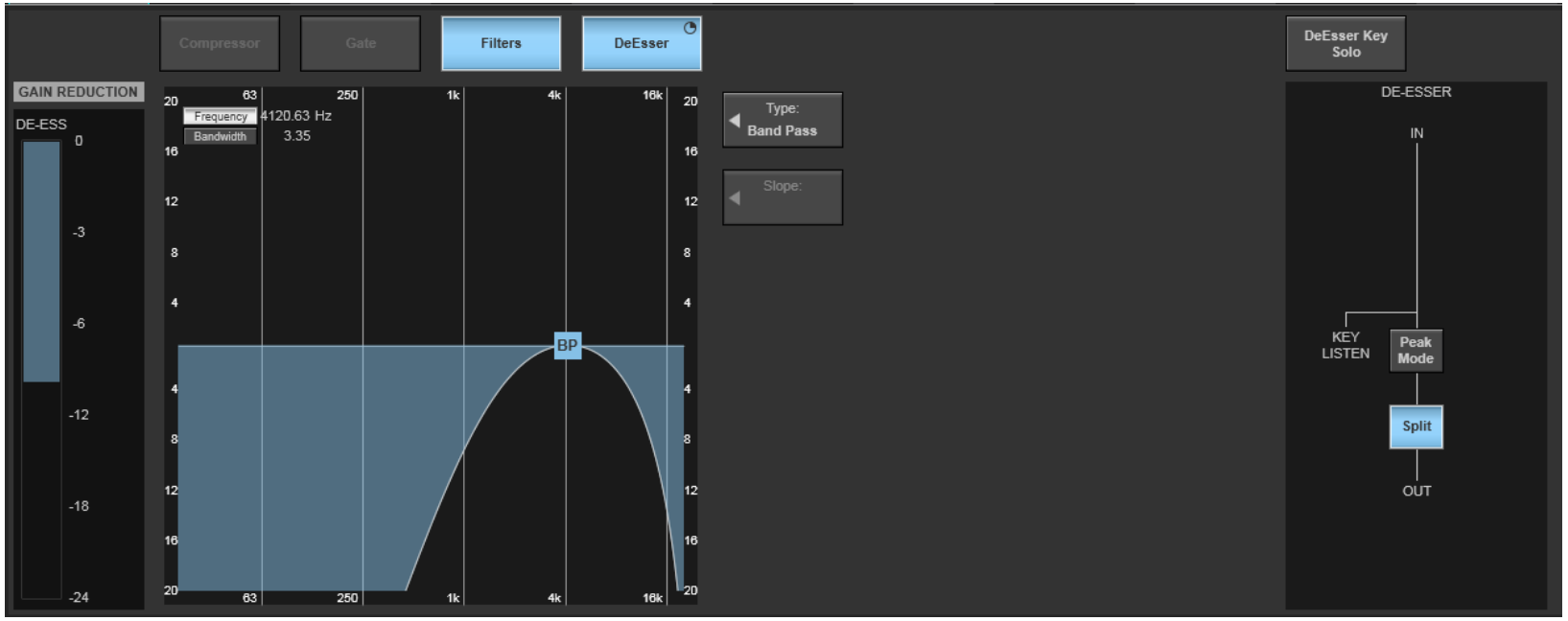
- You can drag the nodes within the graphs displayed using a finger.
- When two nodes are on top of each other, double-tap them to switch which one is selected
- To change the compressor or gate Hold value, use two fingers to pinch the **Comp Time** or **Gate Time** graph.
- To change the compressor or gate (expander mode only) knee value, use two fingers to pinch the **CT** or **GT** node in the main graph.

Side-Chain Filters

The gate and compressor both have side-chains with filters and external input routing. There is a single side-chain filter for each process which can be configured as a High pass or Low pass section with selectable slope, 12, 18 or 24 dB/octave, or as a band pass filter with variable bandwidth. BP bandwidth is adjusted using pinch.



De-Esser



Enabling the **De-ess** option re-configures the compressor as a De-esser. The compressor graphs are replaced by the De-Esser controls. The Compressor and Gate time constant areas will be blank as these controls are preset and optimised for de-essing.

The Threshold controls set a relative threshold with reference to the instantaneous side chain level. It does not set an absolute threshold.

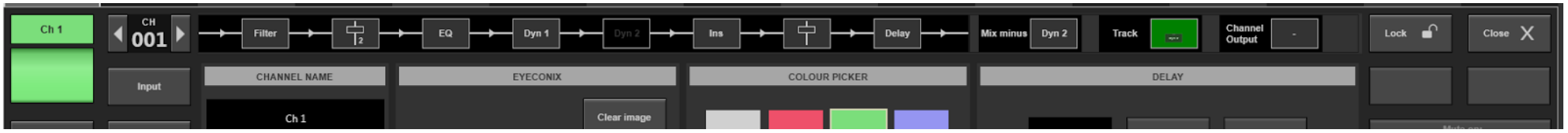
The side chain can use either peak or r.m.s level detection.

In Split Mode only the selected frequency band is processed. With Split off, the full bandwidth signal is processed with just the filtering in the side chain.

The **Comp IN** button becomes the De-Esser IN/OUT switch in De-Ess mode.

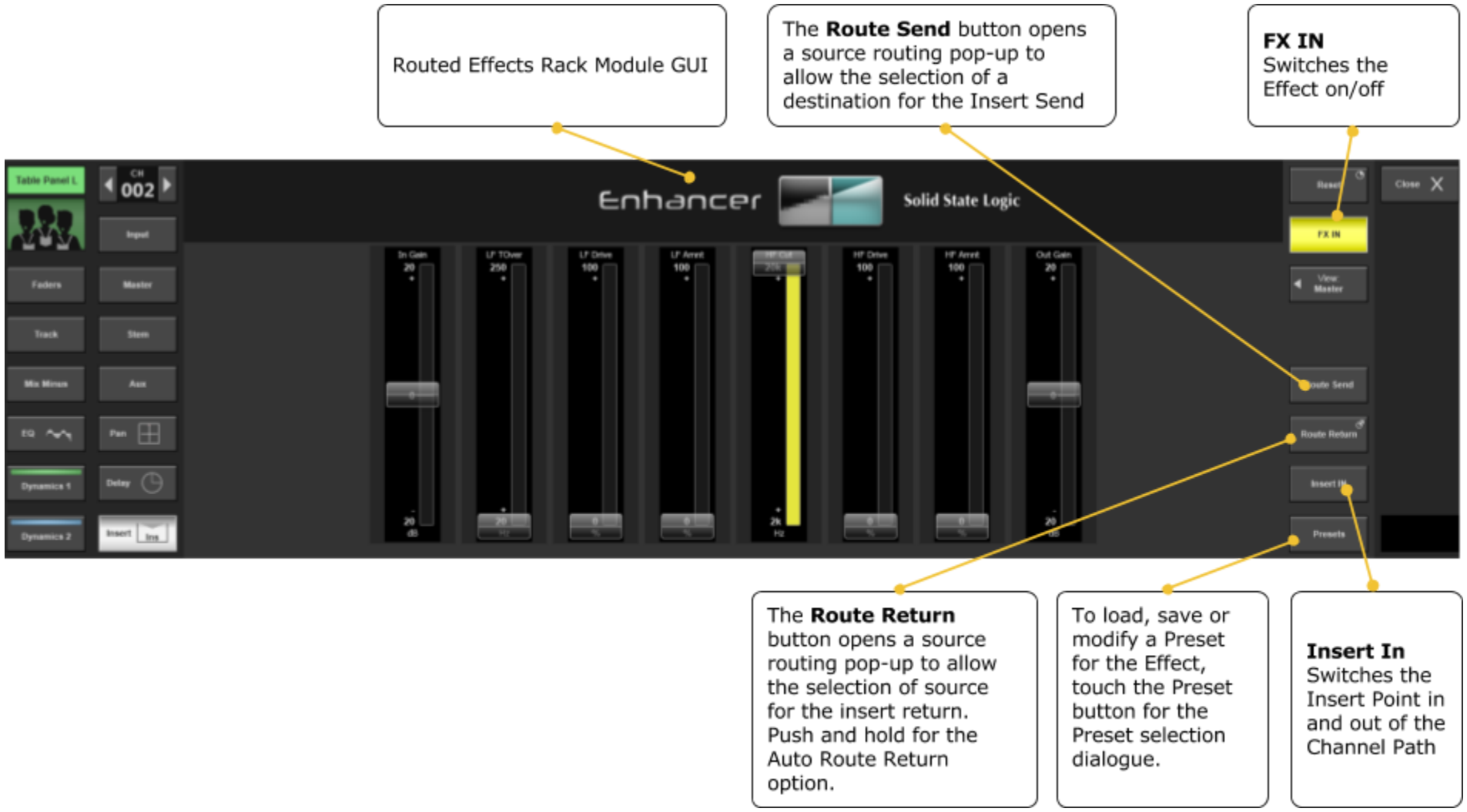
Dynamics in bus sends

In addition to altering the processing order within each path, **for channel and stem paths** Dynamics 1 and Dynamics 2 can be moved to the Channel Output, Mix Minus or Track bus send (this will be in the signal path to all the busses of the same type).



Insert Detail View

Each channel path has an insert point which can be routed to external I/O or to the modules within the console's internal Effects Rack. Once an internal Effects Rack module is routed to an insert point, that module can be controlled from the channel's Insert Detail dialogue or the Channel Tile. Insert routing can be switched in and out using the Insert Quick Controls.


Routed Effects Rack Module GUI
The **Route Send** button opens a source routing pop-up to allow the selection of a destination for the Insert Send
FX IN Switches the Effect on/off
Enhancer
Solid State Logic
The **Route Return** button opens a source routing pop-up to allow the selection of source for the insert return. Push and hold for the Auto Route Return option.
To load, save or modify a Preset for the Effect, touch the Preset button for the Preset selection dialogue.
Insert In Switches the Insert Point in and out of the Channel Path

Note: For details of how to use the internal Effects Rack, see Effects Rack Section.

By default the Insert point is pre-fader but can be moved within the processing order by going to the Eyeconix Detail view, unlocking the Detail View screen and dragging the channel elements in the display across the top of the dialogue.

Routing An Insert

Select **Route Send** to route the Insert send. A standard Routing display will appear. The Effects Rack will appear in the physical column; once this is selected, any Rack and Slot numbers which have a module assigned will then appear in the third column and can be selected in the normal way.

- ***Note: If routing a stereo effect module to a stereo Insert point, simply select the effect slot name and touch Make to route both Left & Right of the stereo effect. Explicitly selecting L or R will route only the 'leg' you selected. (The same can be applied to LCR/4.0/5.1 effects and LCR/4.0/5.1 channel Insert points respectively.)***
- ***Note: You need to configure the module in a Slot in the Effects Rack before attempting to route it.***
- ***Routing to channel inserts can also be performed from within the Effects Rack. See Effects Rack Section.***

To route the return from the same effects rack module as the send, press and hold the **Route Return** button and select the **Auto-route** option. Alternatively, select **Route Return** to route the return signal manually using the same process as for the send.

Note:

- ***The Inserts can also be routed to external effects or other buses/channels within the console. In these instances the Insert Detail page will display a Manual Routing graphic to indicate that it is routed but no Detail View control is available.***

- ***The Detail page will be blank if nothing has been routed to/from the Insert.***

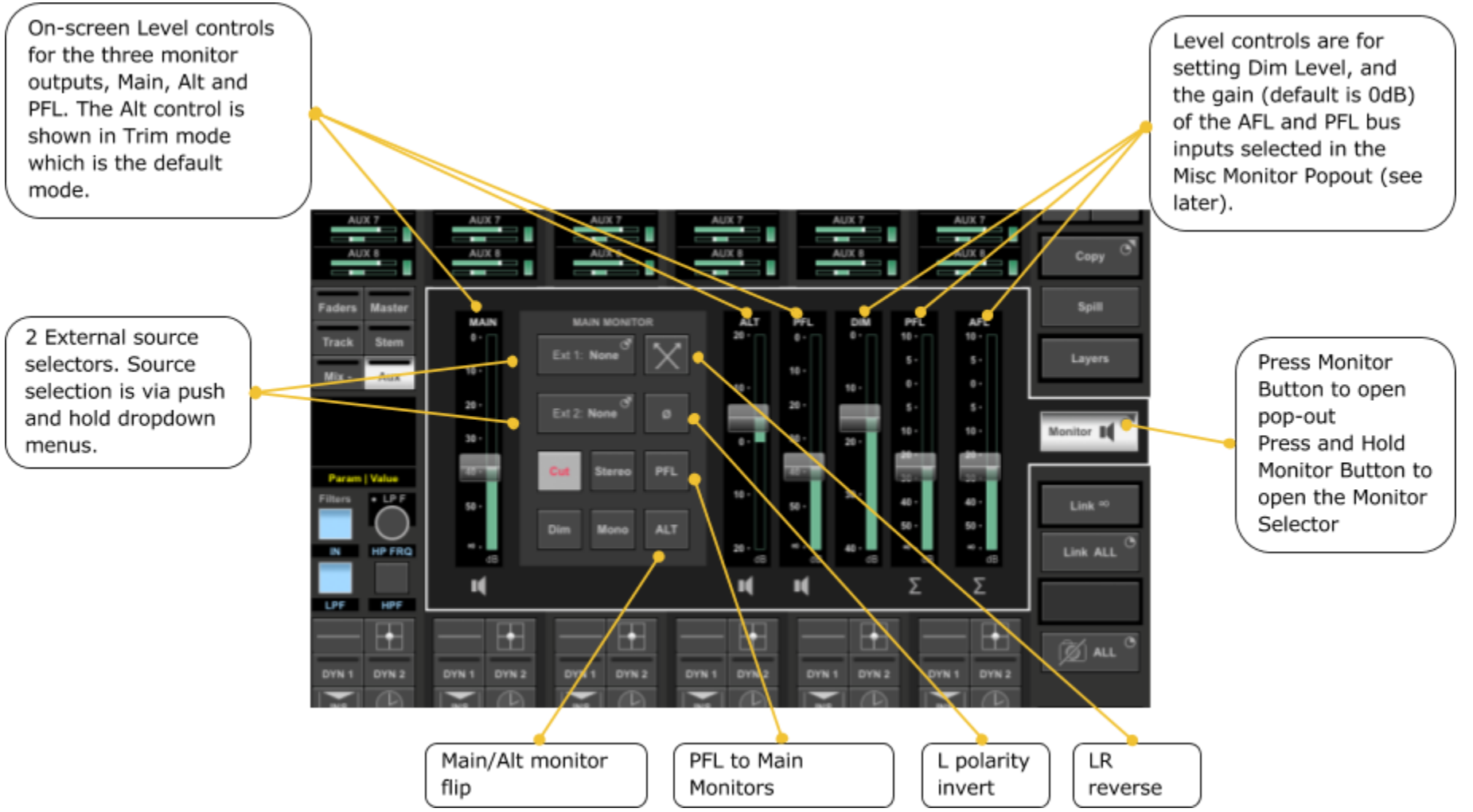
Monitoring

On Screen Monitor Control - Monitor Popout

These provide full control of System T monitoring either supplementing (or acting instead of) the hardware control offered by the Master Tile and the Small Screen **Mon** option. The Monitor Button accesses the Main Monitor Control Popout and, via the Push and Hold drop-down menu, additional Popouts can be selected; the Studio Monitor contains the controls for the 4 Studio Outputs, the Monitor Misc page has further monitor functions such the Monitor Insert switch, additional options for the Alternate and PFL monitor outputs, and the AFL and PFL routing.

These Popouts contain all the Control Room and Studio Monitoring controls with the exception of setting Monitor Level and Delay Calibration. These are accessed from a Tab in the Setup/Options menus so that the basic Monitor Setup is separated from setup options.

Main Monitor Pop Out


On-screen Level controls for the three monitor outputs, Main, Alt and PFL. The Alt control is shown in Trim mode which is the default mode.
Level controls are for setting Dim Level, and the gain (default is 0dB) of the AFL and PFL bus inputs selected in the Misc Monitor Popout (see later).
2 External source selectors. Source selection is via push and hold dropdown menus.
Press Monitor Button to open pop-out
Press and Hold Monitor Button to open the Monitor Selector
Main/Alt monitor flip
PFL to Main Monitors
L polarity invert
LR reverse
MAIN MONITOR
Ext 1: None
Ext 2: None
Cut
Stereo
PFL
Dim
Mono
ALT
Copy
Spill
Layers
Monitor
Link
Link ALL
ALL

Studio Monitor Pop Out

Studio Monitor Level

Solo level of the selected Solo Bus

Dim Level

Talkback Level

Talkback DIM (DIM can can be set to ∞ so the TB replaces the selected Monitor source),

LR Split activates the split monitor mode on stereo Studio outputs. This routes Talkback to the Right output and a mono sum of the Monitor Source to the Left output. The push and hold drop down menu selects the Auto option, so that the Split mode is activated only when the TB function is ON.

Studio Monitor Source Select

A Console Solo bus can be assigned to the Studio Monitor. The available options are None, AFL1, AFL2, PFL1, or PFL2.
The Solo button replaces the Monitor Source with the selected Solo bus.

Monitor **Dim**, **Cut** and **Talk** functions which can be activated either from the Popout button OR remotely via the Events Manager.

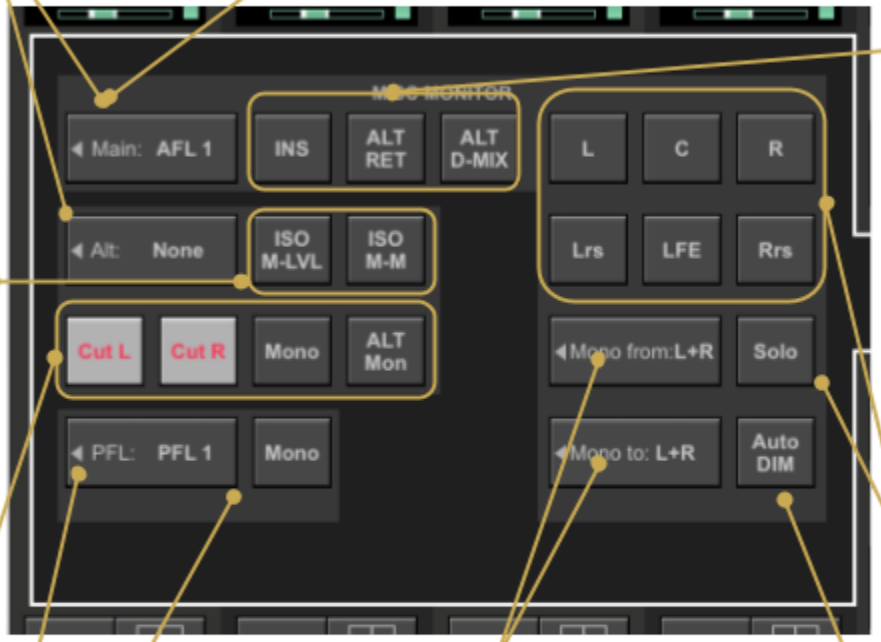
Studio Monitor **Solo** Select
The push and hold drop down menu allows selection of an **Auto** function, so that Solo is automatically activated when a signal has been routed to the selected Solo bus.
When the Auto Function has been activated, the standard Solo button function will be locked out unless push and hold is used to access the drop down menu and disable the Auto Solo function.

Misc Monitor Popout

Additional options for the three Monitor Outputs can be found in this Popout.

Selected console solo bus to feed Main/Alt speaker outputs. This is a nested menu so that it is possible to select both an AFL bus and PFL bus to the same monitor output.
PFL always has priority when AFL and PFL are assigned to the same monitor output.

Solo bus assignment is exclusive and a maximum of single AFL and PFL bus can be selected for each monitor section.
By default both AFL 1 and PFL 1 are routed to the Main Monitor output.
Selecting a Solo bus to a different monitor output via the drop down menu, automatically deselects the bus from its previous monitor output and updates the label on the monitor output menu button to reflect the change.



INS - Selects the 6 channel insert return signal as the Monitor source.
ALT RET - Selects the Alt Stereo Return input as the source for the stereo check functions, replacing the output of the 5.1 stereo downmix (this is primarily to monitor an externally generated stereo downmix Lt Rt signal instead of the console level controlled downmix).
ALT D-MIX - Selects the alternate multichannel fold down gain coefficients that are set in the Setup/Options/System menu

ISO M-LVL - Isolate Alt Level Control from Main Monitor Level
ISO M-M - Isolate Alt Mute from Main Monitor Dim/Cut

ALT Monitor Output

Cut L, Cut R - Mute ALT output **Mono** - Locks the output into Mono
ALT Mon - Enables the separate Alt Monitor Input so that two sources can be monitored simultaneously on the Main and Alt monitor outputs.

Main monitor mutes (default) or solos, depending on the status of the **Solo** Switch

PFL Output Select

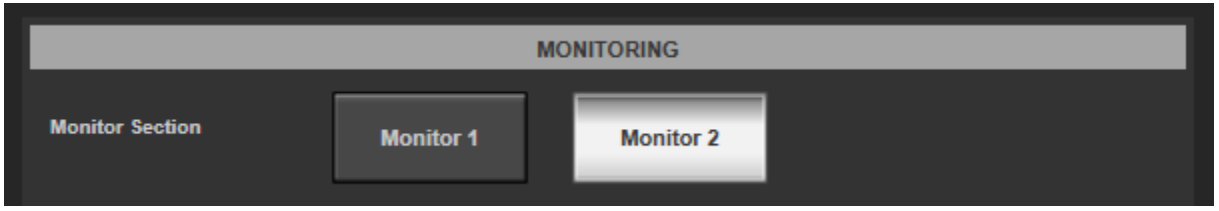
PFL **Mono** Select

Two buttons to select mono source mix signal and to which monitor outputs it is routed to when the the **Mono** Monitor key is activated. Options for both are L, R, L+R. Default is L+R.

Auto-DIM
Enables an Auto Dim function on the Main Monitor output, if a PFL bus has been assigned to the Alt or PFL monitor output and there is an active Path PFL solo.

2nd monitor section control

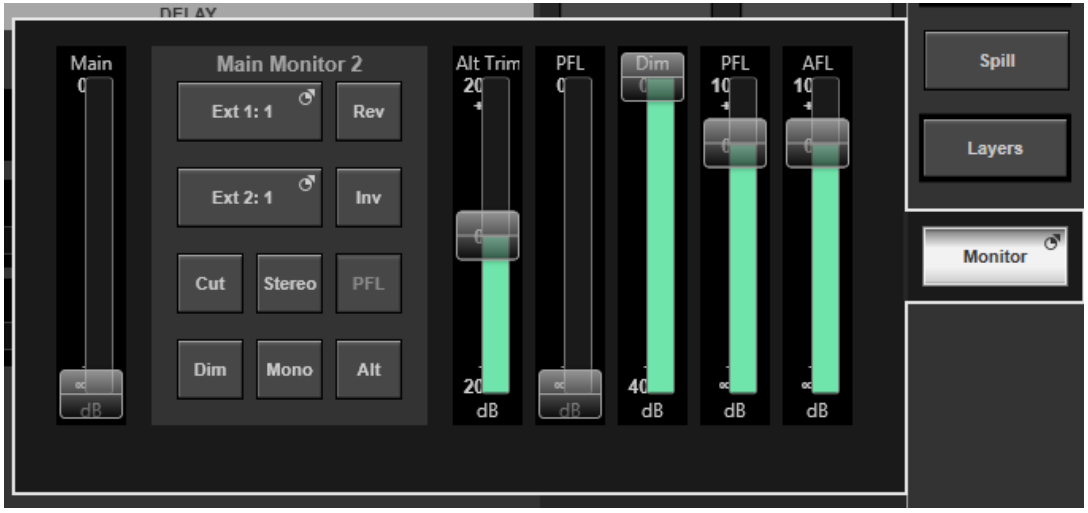
Any control interface (surface or T-SOLSA) can be set to be controlling either monitor section 1 or 2.
This is selected in the **Setup**/**Options**/ **Monitoring** tab.



The selection of the specific monitor section applies to all the GUI and hardware controls physically connected to that control instance.

Additional channel view user bays within a console, remote connected T-SOLSA computers, or remote connected consoles can be independently assigned to each monitor section.

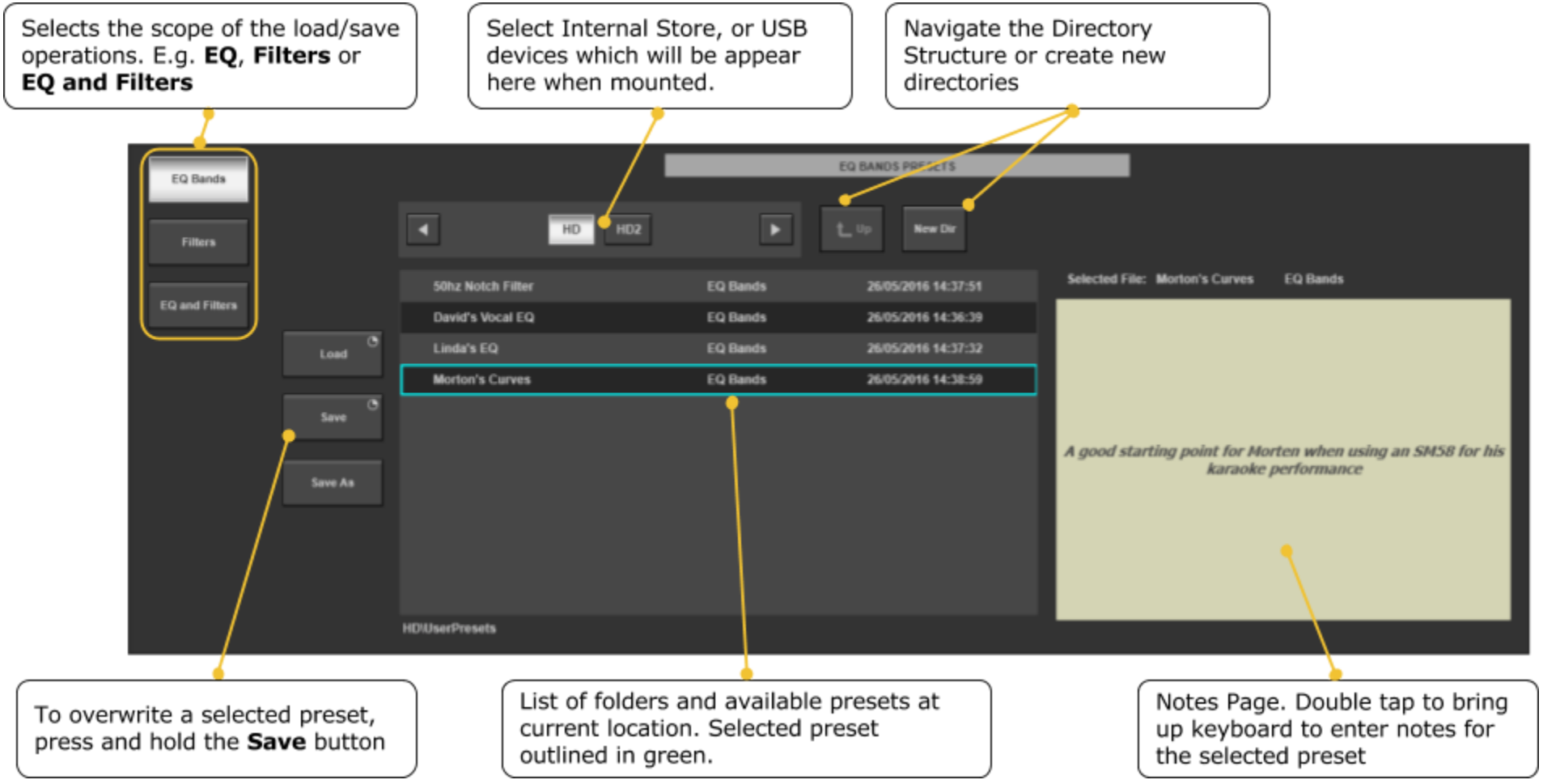
The second monitor section exists as it's own routable points with Main, Alt and PFL outputs, plus insert A and B available at all times.



Presets

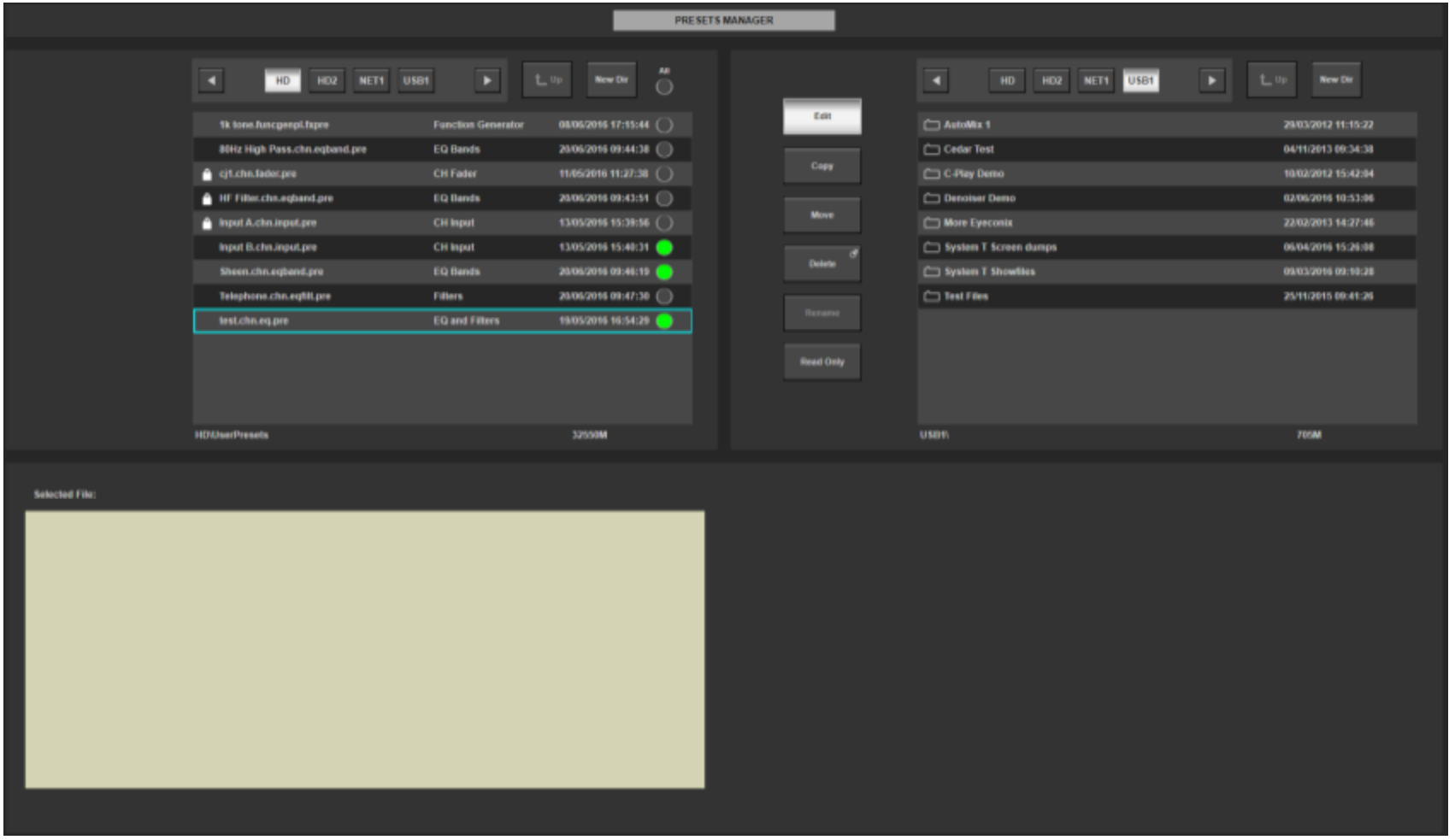
All of the channel settings found in the Detail Dialogue can be saved and recalled using Presets; these Presets can cover the entire channel or smaller segments of it.
To open the Preset list for any area of the console, open the Detail dialogue to the appropriate page and touch the **Preset** button towards the bottom right corner. The Preset list will open within the Detail dialogue:

Press **Preset** again to close the Preset list.


Selects the scope of the load/save operations. E.g. **EQ**, **Filters** or **EQ and Filters**
Select Internal Store, or USB devices which will be appear here when mounted.
Navigate the Directory Structure or create new directories
EQ Bands
Filters
EQ and Filters
Load
Save
Save As
HD
HD2
Up
New Dir
50hz Notch Filter EQ Bands 26/05/2016 14:37:51
David's Vocal EQ EQ Bands 26/05/2016 14:36:39
Linda's EQ EQ Bands 26/05/2016 14:37:32
Morton's Curves EQ Bands 26/05/2016 14:38:59
HD\UserPresets
Selected File: Morton's Curves EQ Bands
A good starting point for Morten when using an SM58 for his karaoke performance
To overwrite a selected preset, press and hold the **Save** button
List of folders and available presets at current location. Selected preset outlined in green.
Notes Page. Double tap to bring up keyboard to enter notes for the selected preset

The Main (System's) Preset List

You can also view and manage a complete list of the console's Presets by opening the main Preset List, accessed via the **Menu|Setup|Presets** menu:



Edit Mode

As with Showfiles, a number of folder actions are only available when the Preset list is in Edit mode. To activate Edit mode, touch the **Edit** button in the top-centre of the Main Preset List screen. The button will 'light' and a second navigation pane will appear in the right side of the screen.

To select a Preset to be edited using any of the edit actions listed between the panes, navigate to it in the left navigation pane and touch the circle at the end of its list entry – the circle will go green to indicate that the Preset is Edit Enabled. You can select multiple Preset and multiple folders. You can also select all Presets and folders in the current location by touching the **All** circle at the top of the list.

Remember: Edit mode functions always act on the Presets which are Edit Enabled, and not on Presets which are highlighted (displayed with a coloured surround).

Moving and Copying Presets

To move or copy files and folders, navigate to the source folder in the left pane, and the destination folder in the right navigation pane;
In the left navigation pane, Edit Enable the items to be moved or copied;
Now press the **Move** or **Copy** button in between the two panes. The items will be moved or copied to the new location.

Note: Items cannot be copied into their current location.

Making Presets Read-Only

You can make Presets read-only in order to prevent them from being overwritten via the Save function.
To select the Presets to be made Read-Only, navigate to them in the left navigation pane and Edit Enable them.
Now press the **Read Only** button in between the two panes. A padlock symbol will appear before the file names.
To undo a file's Read Only status, simply repeat this procedure.

Renaming Presets and Folders

To rename a file or folder, navigate to it in the left navigation pane and Edit Enable it.
Now press the **Rename** button between the panes, rename the Preset using the keyboard which appears, and touch **OK**.

Note: The renaming function only allows you to change the 'user' part of the filename.

Deleting Presets and Folders

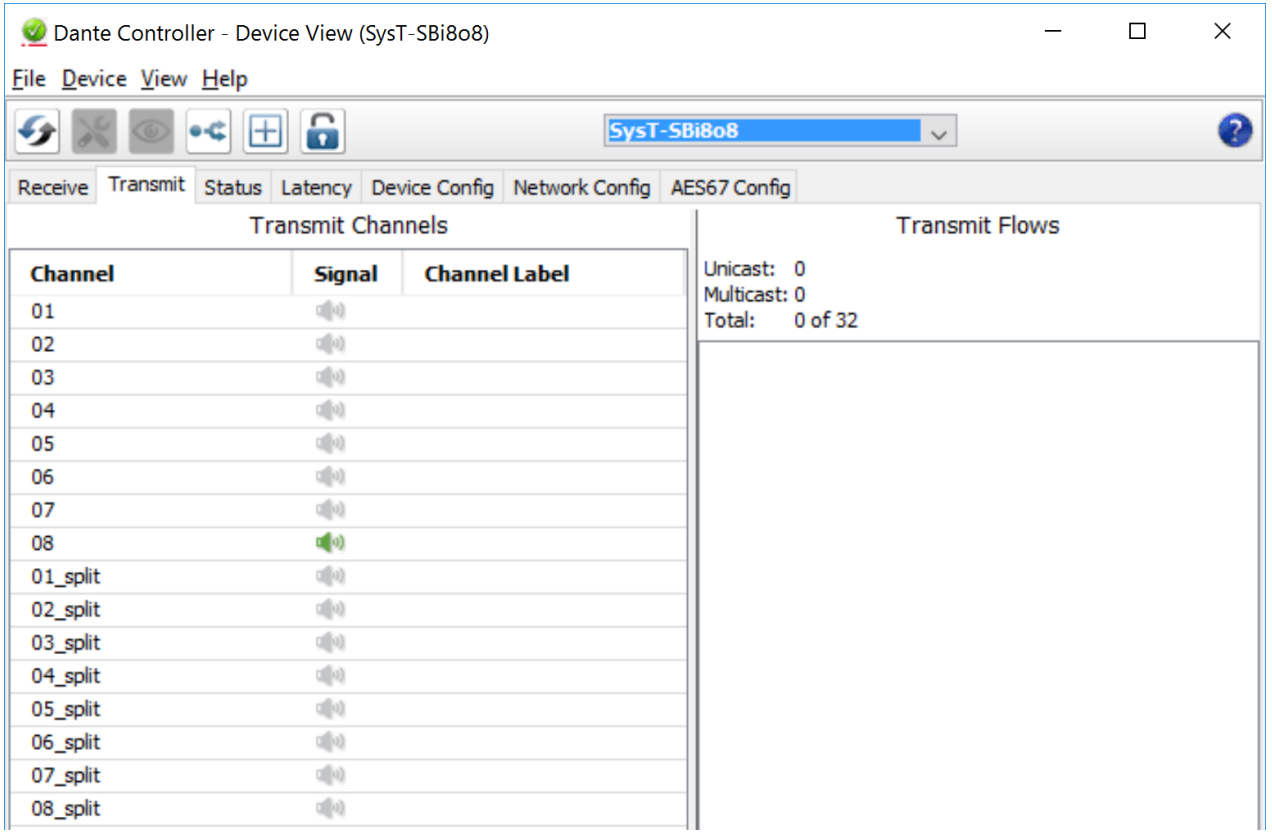
To delete Presets or folders, navigate to them in the left navigation pane and Edit Enable them.
Now press-and-hold the **Delete** button between the panes.

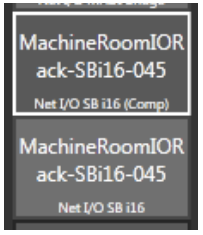
Note: Folders must be empty before they can be deleted. Presets with Read Only protection cannot be deleted.

System T IO

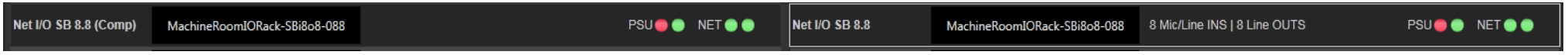
SB 8.8 and SB i16 Gain compensated outputs

Each stagebox Mic/Line input has two transmit channels that can be subscribed to in the Dante network. In Dante controller the hard coded channel transmit names represent the input channel number and indicate if the signal is the split signal.



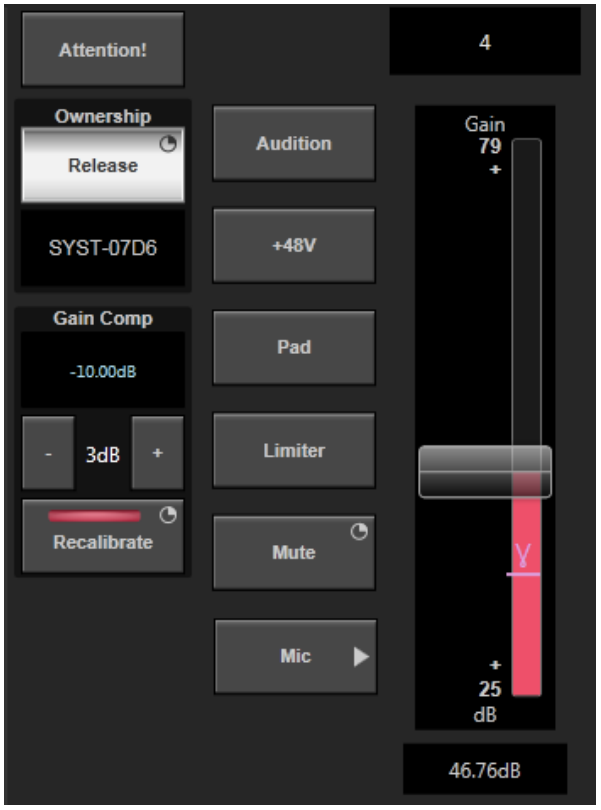


When connected to an SSL console or the Network I/O controller app the main and compensated channels show as two separate devices. Only the Main device offers control of the Stagebox gain settings and other controls. The Compensated device can never own be owned or be controlled.



Network IO gain compensation is designed to be an extremely open system and is available for use with SSL consoles or any other Dante connected device. The Compensated output gain processing takes place in the Stagebox itself, so any Dante device can receive the compensated signal, it does not have to be an SSL device. As with any Dante device all the Tx channels can be routed to single or multiple Dante devices.

Gain Compensation works by applying a digital trim offset, which is the negative equivalent of the analogue gain change value. The GUI shows a Gamma point, this is the point at which the analogue gain value results in a digital trim value of 0dB, i.e. no digital trim is applied. Digital trim will be applied when the analogue gain level is above or below the Gamma point. The Gamma point is indicated on the analogue fader gain readout as ɣ.



The owner of an input has access to the Gain Compensation Re calibrate button. Pressing and holding Recalibrate will reset the Gamma point. When the preamp is in Line mode, pressing and holding Recalibrate will move the Gamma point to the current position of the analogue gain knob. This means that the analogue gain value now equals a digital trim value of 0dB and no digital trim is applied. When the preamp is in Mic mode, pressing and holding Recalibrate will move the Gamma point to 10dB below the current analogue gain. This feature has been designed to protect the compensated signal against digital clipping across the transport, in the event that the analogue gain control is drastically reduced. Therefore after recalibration the initial digital trim value is -10dB. Pressing the + or - 3dB buttons raises or lowers the Gamma point by 3dB, changing the digital trim by the same amount.

Effects

System T offers a wealth of signal processing options in its Effects Racks, which can be routed into the insert points of any channel type or used as stand alone effects via the console Routing menu.

To open the Effects Racks screen, select **Menu|Effects**:

There are eight Racks, displayed as columns in the top half of the screen. Each Rack has 12 module Slots in it, of which four are visible at any one time; scroll the racks by swiping the racks up or down.

The Rack number is shown in the right of the Rack header, and the Slot number is shown in the right side of each module.

Touch a module to 'Select' it, assigning its controls to the Detail area in the lower half of the screen:

To name a Rack, double-tap the box in the centre of its header, type a name using the keyboard which appears, and press **OK**. These names will be displayed in the Routing pages when routing to or from the Effects Rack, to facilitate routing the correct effect.

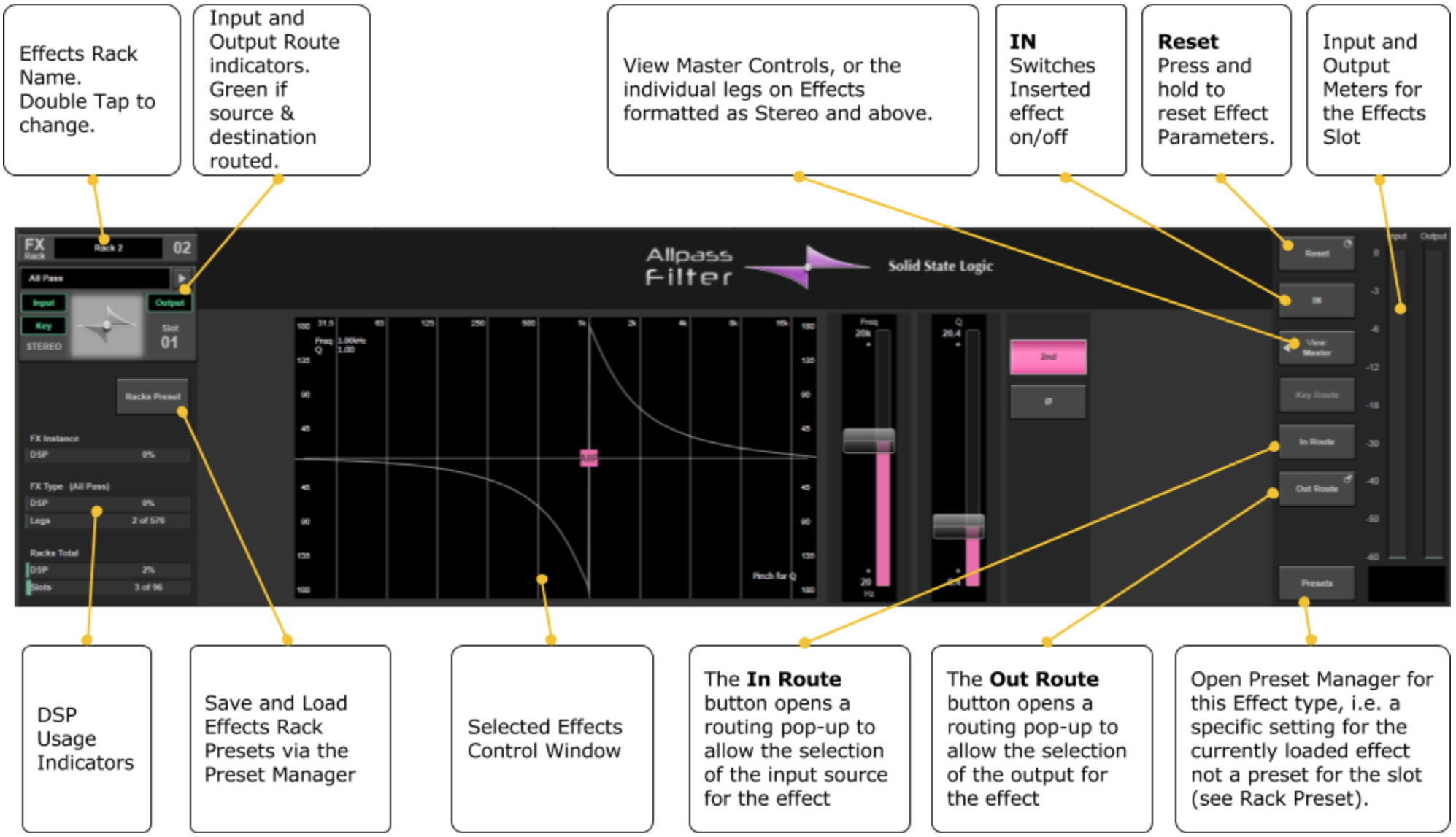
Loading Modules Into Racks

Any Module can occupy any position in the racks, so you can arrange them in whatever way suits your way of working. To change a module or place a new one into the rack:
Touch the arrow button in the top-right corner of the slot you want to use (to the right of the module label - this will be blank if empty);
Select the channel format for the module using the submenu which appears – **Mono, Stereo, LCR, 4.0, 5.1, 4-Wide, 8-Wide** or **12-Wide** (or select None to leave the slot empty);
Select the type of module from the next submenu, then select the specific unit. That Module will now be loaded into the slot.
To name the slot, simply double tap on the effect name and use the popup keyboard to enter your own name. These names will be displayed in the Routing pages when routing to or from the Effects Rack, to facilitate routing the correct effect. Note that only slots with effects loaded can be named.

- ***Note: The module controls in the left side of the FX Detail dialogue can also be used to populate and name the currently selected slot.***
- ***Note: The Recent submenu in the FX Select menu gives you quick access to the 10 last used effect modules (including format) for adding multiple instances of the same effect.***

Effects Module - Common Display Elements

When a module is selected and appears in the module Detail area in the bottom half of the screen, there are a number of standard elements which appear to its left and right:


Effects Rack Name. Double Tap to change.
Input and Output Route indicators. Green if source & destination routed.
View Master Controls, or the individual legs on Effects formatted as Stereo and above.
IN Switches Inserted effect on/off
Reset Press and hold to reset Effect Parameters.
Input and Output Meters for the Effects Slot
Allpass Filter
Solid State Logic
DSP Usage Indicators
Save and Load Effects Rack Presets via the Preset Manager
Selected Effects Control Window
The In Route button opens a routing pop-up to allow the selection of the input source for the effect
The Out Route button opens a routing pop-up to allow the selection of the output for the effect
Open Preset Manager for this Effect type, i.e. a specific setting for the currently loaded effect not a preset for the slot (see Rack Preset).

The DSP usage indicators in the lower left of the screen provide a visual indication of the amount of processing currently in use:

- **FX Instance DSP**: Total amount of FX processing used by the selected module
- **FX Type DSP**: Total amount of FX processing used by all instances of the selected effect type
- **FX Type Legs**: Number of instances of the effect type used
- **Racks Total DSP**: Total amount of processing used by all modules in the Effects Rack
- **Racks Total Slots**: Number of FX rack slots used

Routing Modules
You can also route effects modules into channel inserts using the standard Routing display accessed from the channel's Insert Detail view.

Press and hold the channel's Insert **Route Return** button to get the option to automatically route the return from the same module as the send. Once the Insert Send and Return have been routed to the Effect Rack slot, the effects module will also appear in the channel's Detail dialogue for that Insert point, with full control provided in the usual way.

Note: For mono, stereo, LCR, 4.0 and 5.1 effects, the format of the effect module should match the format of the channel into which it is inserted. To route all legs of the effect, simply select the module name and press Make in the routing page. Explicitly selecting the L/C/R etc. leg before pressing Make will only route the leg selected.

Routing can also be done from the Effects Rack slot itself. Use the **In Route**, **Out Route** and **Key Route** buttons to open up the appropriate routing pages. This method also allows effects to be used standalone and for modules to be 'daisy-chained' by routing out of one module into another before routing the last module back to a channel. Use the **FX IN** buttons to the right of each module to bypass individual effects in a chain.

If routing a single effect to and from an Insert Point, make the input route then press and hold the **Out Route** button and select the **Auto-route Output** option to route the output of the effect to the same Insert Point.

Note: If inserting daisy-chained effects modules into a channel Insert point, only the last module in the chain will appear in the channel's Insert page.

All effects modules can have their settings stored as Presets. This can be performed either for individual modules or for complete racks.
Presets are loaded and saved in the usual way.
To access the Preset list for a module type, first load the effect type into an empty rack slot then touch the **Preset** button in the bottom right of the module's Detail dialogue. Only presets for the loaded effect type will be shown in the list.
To access the Preset list for the whole rack, touch the **Racks Preset** button to the left of the Detail dialogue.

Effects Detail

Delay Effects

Tempo Link And Tap Tempo
All of the delay effects below have a Tempo Link button, allowing the Tempo buttons of multiple delay effects in a single FX Rack to be linked together and 'tapped' simultaneously.

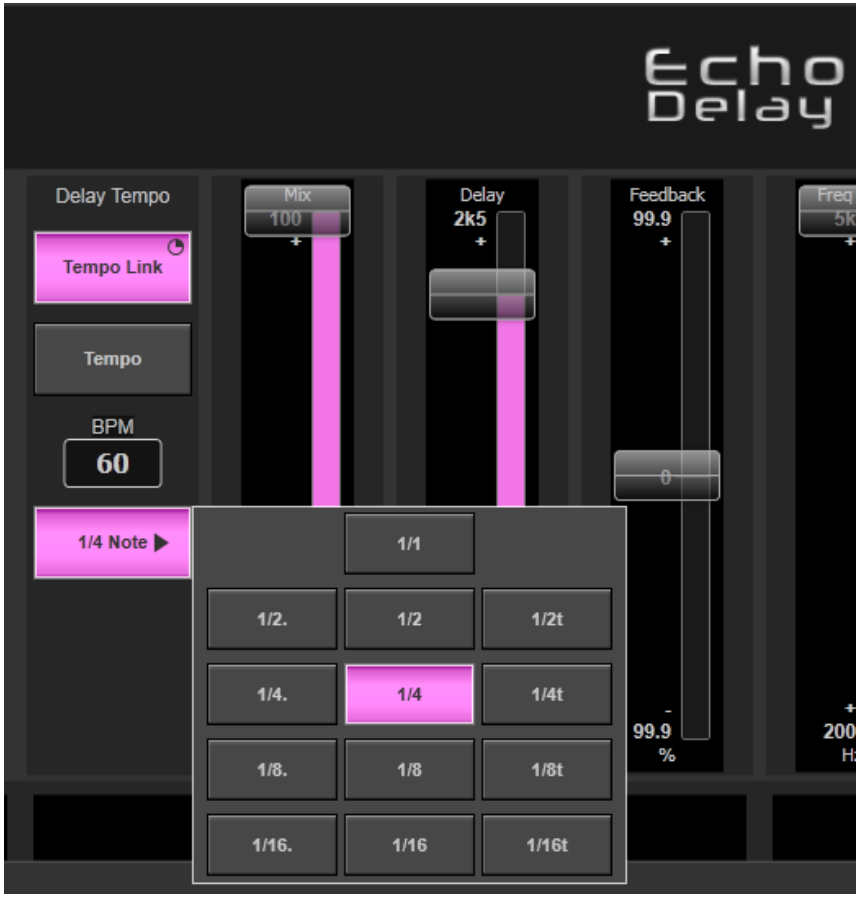
Ensure any effects you wish to link are within the same FX Rack (vertical column). Press & hold the Tempo Linkbutton of each effect module you wish to link.

Tapping the **Tempo** button of any Tempo Linked module will now adjust the tempo of all Tempo Linked modules in the same FX Rack (up to their delay limits).

The **BPM** display to the right of the **Tempo Link** button displays the BPM (Beats Per Minute) for the current effect module. Double tap the display to enter a specific BPM value. The BPM value can be 'multiplied' by using the **Note** menu below it.

- A Note value of 1/4 (quarter note, or crotchet) matches the delay to the tapped tempo.
- A Note value of 1/8 (eighth note, or quaver) doubles the rate of the delay to the tapped tempo (i.e. halves the delay time).
- A Note value of 1/2 (half note, or minim) halves the rate of the delay to the tapped tempo (i.e. doubles the delay time).
- Dotted Note values (e.g. 1/4.) are the equivalent of one and a half times the Note value (i.e. slower delay rate that non-dotted equivalent).
- Triplet Note values (e.g. 1/4t) are the equivalent of three notes in the space of two of the Note value (i.e. faster delay rate than non-triplet equivalent).

Tempo Linked effect modules will keep their BPM tempo synchronised (within the maximum delay values for each effect), but the Note values are independent, allowing different effect modules to have different multiples of the 'base' tapped tempo.



Echo Delay

The simple Echo Delay is available with a maximum delay of either 1.25 seconds or 2.5 seconds.
Most of the Echo Delay module's controls should be self-explanatory, though the following notes may help to clarify them:

Note: In addition to the Delay slider, the delay time can also be set by tapping the Tempo button in time: the unit's delay will be defined by the pause between taps.

Note: The Feedback is the amount of delay signal fed back into the band's input, as a percentage of the original signal. To have no feedback, place the slider at the mid point; move the slider up from the middle to increase the feedback signal from 0% to 99.9%; move the slider down from the middle to increase the feedback of the inverted signal from 0% to 99.9%.

Tape Echo

The Tape Echo module emulates an analogue tape echo device, with controls for adjusting **Drive** and Wow & Flutter (**W&F**), in addition to **Bass** and **Treble** tone controls.

The **Repeats** control allows you to adjust the amount of signal fed back into the module. A positive feedback loop can be created that will saturate the effect, just like an analogue tape unit.

Dynamics Modules

Bus Compressor

The **Threshold, Make Up, Attack, Release** and **Ratio** controls are an emulation of the classic analogue SSL Bus Compressor module.

The **Auto Release** button automatically defines the release time according to the duration of the peak signal.

The **Mix** control allows a blend of the compressed and original uncompressed signals to be mixed together for parallel compression effects.
The Input **Gain** control adjusts the gain of the signal entering the compressor module.

A kick-down compression meter in the right side of the module provides visual feedback on the gain reduction action.

De-Esser

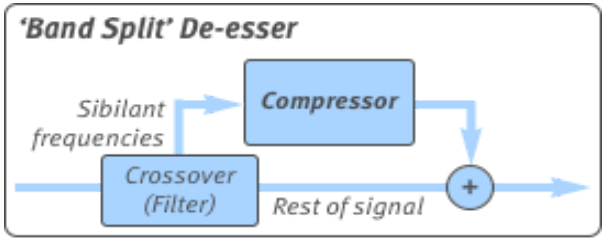
The De-esser is a compression and filter system which can be used to remove sibilance or other frequency-dependent artefacts.

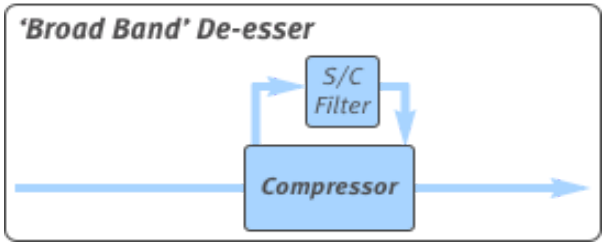
Definition: Sibilance is the resonance often found on vocal mics which can result in 'S' consonants becoming too pronounced.

Start by selecting which configuration of de-esser to use. The diagrams to the left explain the difference between **Broad Band** and **Band Split** de-esser configurations.

Set the **Filter Type** and **Freq**uency to ensure the de-esser is responding to the right frequency range.

Note: The filter position within the de-esser depends on the compressor configuration, as shown below.





Move the **Threshold** control to set the detection level at the point where the De-esser only acts on sibilent peaks.

Move the **Ratio** knob to control how much sibilance is removed.

To listen only to the sibilance that is being removed, press the **Solo** button. This can be particularly helpful in ensuring that the threshold is correctly set.

An attenuation (**Attn**) meter is shown to the right of the Solo button.

Dynamic EQ

The Dynamic EQ is available with 1-, 2- or 4-bands of EQ, and the **B1** to **B4** buttons in the left column define which band is being edited in the rest of the window.

For each band, configure the Frequency (**Freq**) and **Q** of the EQ band to be compressed using left sliders; define the shape of the EQ filter using the button above the **Freq** slider.
Use the remaining sliders to control the action of the compressor; A kick-down compression meter in the right side of the module provides visual feedback on the overall gain reduction action across the four bands.

Note: Dynamic EQ has an auto knee that goes from 12dB when the compression ratio is 1:1 to 0dB when the ratio is ∞:1, ie it becomes progressively harder as ratio increases.

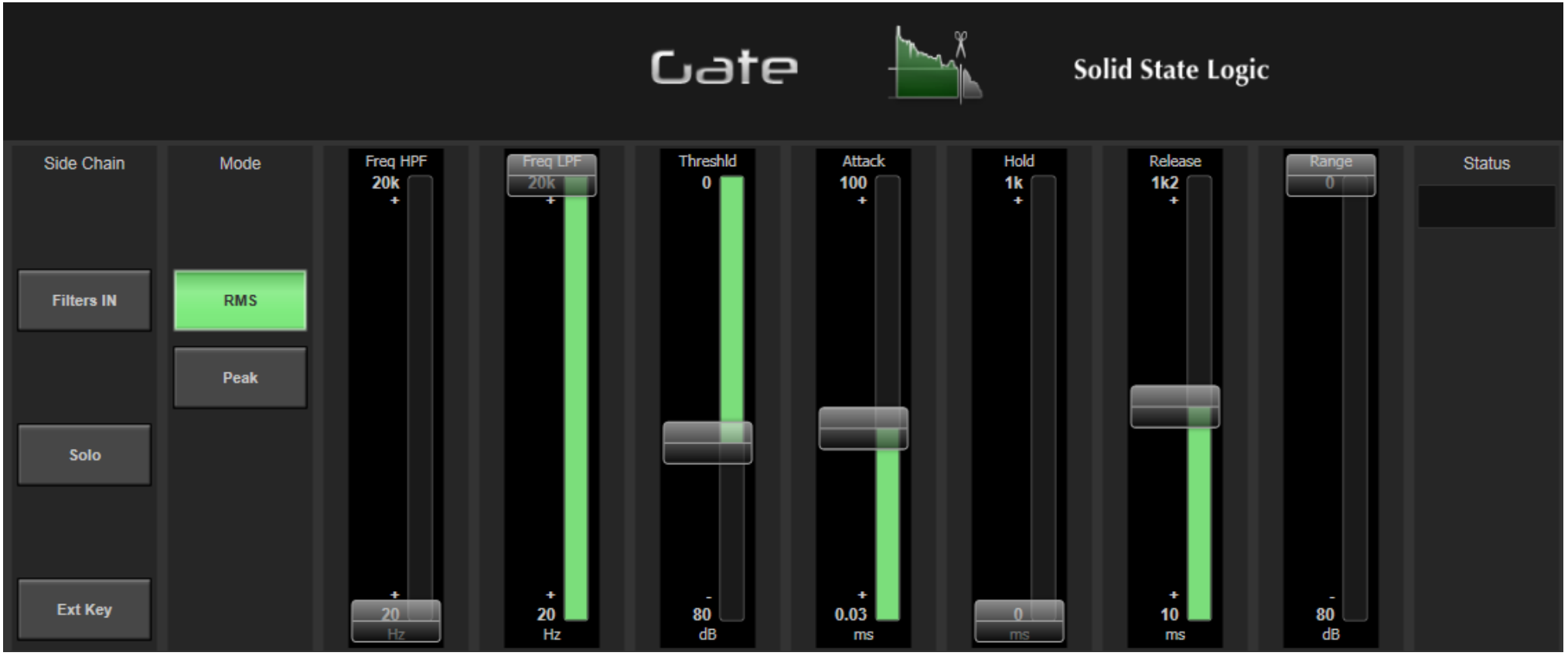
If a +ve EQ **Gain** is dialled in then the effect works in boost mode and EQ is triggered by signals below the **Threshold** level. Conversely, if a -ve EQ **Gain** is selected then the effect works in cut mode and EQ is triggered by signals above the **Threshold**.

Summary of effect of controls on the amount of gain added / gain reduction

	Controls					
	Gain		Threshold		Ratio	
Mode	**Lower**	**Higher**	**Lower**	**Higher**	**Lower**	**Higher**
Boost (gain added)	Less	More	Less	More	Less	More
Cut (gain reduced)	More	Less	More	Less	More	Less

To reset the band, press-and-hold the band's **B** button and select the **Reset** option from the drop-down list that appears.
To reset the whole module, press-and-hold the **Reset FX** button.

Gate



To activate the Gate, drag the **Range** down to a suitable level. The **Range** controls the dynamic range over which the gate operates.

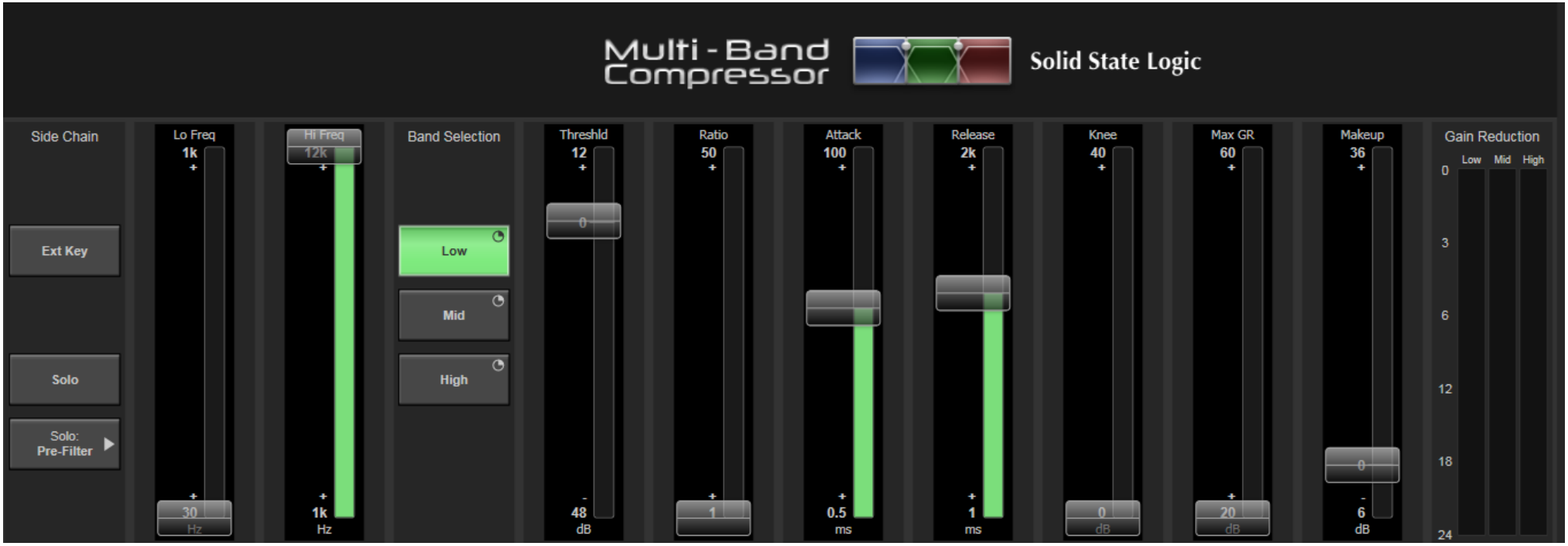
The buttons in the top left allow you to select between **RMS** and **Peak** response mode.

The **Thresh** (threshold) defines the audio level at which the gate is opened to allow audio through.

Note: The level at which the gate opens is higher than the level at which it closes again. In other words, when the expander is opened, it stays open until the signal level crosses the quieter 'close' threshold. This is known as hysteresis and is very useful as it allows instruments to decay more naturally. The Thresh control refers to the 'open' threshold.

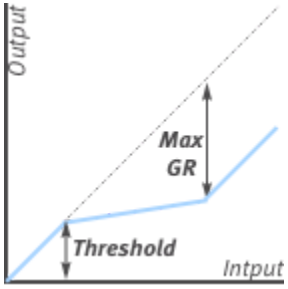
Hold controls the delay before the signal level starts reducing again, and **Release** controls how quickly the level then reduces. **Attack** controls the time taken for the Gate to 'recover' once the signal level is above the open threshold. 1.5ms (per 40dB) is a good Attack starting point, though percussive sounds may require an attack in the region of 0.1ms.
The 'traffic lights' towards the top-left indicate the gate's status: red indicates that the gate is closed (no audio is being passed), green that it is open (audio is being passed at full level), and yellow that it is opening or closing.
The meters at the right of the module show the module's input and output levels.

Multi Band Compressor



There are three bands of compression available within the Multi-band compressor; touch the **Low**, **Mid** or **High** buttons in the top left to define which band is being edited in the rest of the window. The sliders to the right of the buttons define the crossover frequencies between **Low** and Mid bands, and between Mid and **High** bands.

Each band's controls should be self-explanatory. The possible exception may be **Max GR** which limits the maximum amount of gain reduction, meaning that peaks which are well over the threshold are only attenuated up to the **Max GR** value. The rest of the dynamic range is left unaltered, and behaves as expected according to the other controls.



To reset a band, press-and-hold its button;To reset the whole module, press-and-hold **Reset FX**.

Reverb Effects

ER-Verb
The ER (Early Reflections) Reverb has 5 different algorithms, with different size and surface characteristics: Ambient, Tight, Recording Room, Stadium and Cathedral.

Each module has two pages, toggled using the **ER Page** button.
The main page provides standard room simulation controls such as Pre-Delay, Decay and the ratio between early reflections and reverb tail (ER : Rev);
The ER Control page is for early reflection parameters such as Density and Damping controls.

LeVerb
A sophisticated, multi-slider, multi-purpose reverb unit which is simple to use.

'Other' Effects

The 'Other' submenu brings up a few more advanced modules which should function intuitively if you are familiar with the principles involved:

De-Noiser

The De-Noiser module is a frequency-selective noise reduction algorithm, allowing you to dial in the 'shape' of the noise to eliminate it more effectively.

The six gain sliders control the wet/dry mix between the 'noisy' and de-noised signals in each band. At 0dB gain, there is an equal mix between the noisy and de-noised signals. Increasing the gain increases the amount of the noisy signal added back into the mix. Threshold sets the level of the noise. Anything below this is considered noise by the noise detection algorithm.

Range defines the frequency ranges over which the De-Noiser works. These are:

Range	Band 1	Band 2	Band 3	Band 4	Band 5	Band 6
Full (35Hz - 10.2kHz)	35 Hz	110 Hz	340 Hz	1.1 kHz	3.3 kHz	10.2 kHz
High (4.5kHz - 15.9kHz)	4.5 kHz	5.8 kHz	7.5 kHz	9.6 kHz	12.4 kHz	15.9 kHz
Mid High (291Hz - 12.4kHz)	291 Hz	616 Hz	1.3 kHz	2.8 kHz	5.8 kHz	12.4 kHz
Mid (266Hz - 4.5kHz)	266 Hz	468 Hz	825 Hz	1.5 kHz	2.6 kHz	4.5 kHz
Low Mid (32Hz - 3.7kHz)	32 Hz	83 Hz	215 Hz	557 Hz	1.4 kHz	3.7 kHz
Low (26Hz - 312Hz)	26 Hz	42 Hz	70 Hz	115 Hz	189 Hz	312 Hz

ATK and REL controls determine the Attack and Release speed of the filters.

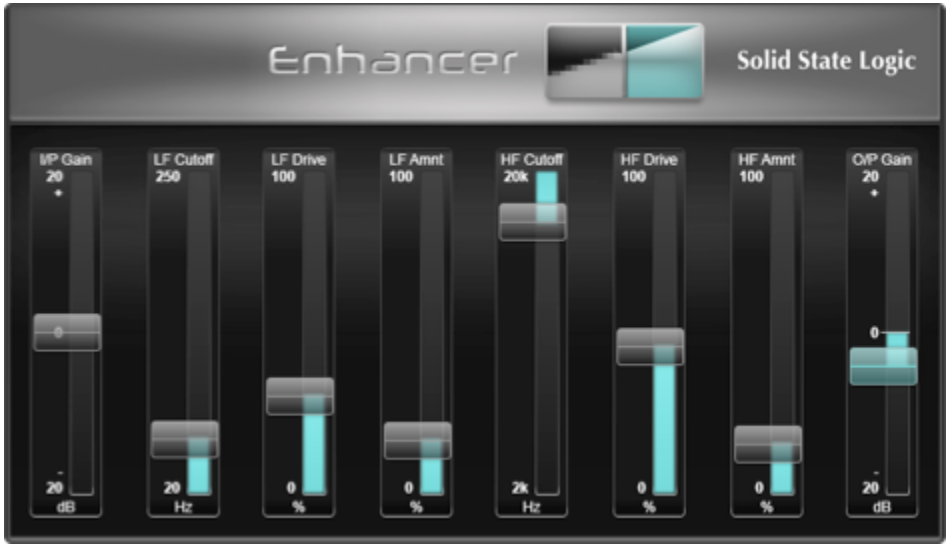
Operation

1. Set the Threshold to the appropriate level such that, in each band, everything below the threshold is 'noise' and everything above it is 'signal'. This can be done by setting the Range to Full, all the Gains to -24dB, and then by slowly moving the Threshold up from -80dB until the 'noise' disappears.
2. Select the appropriate Range in which the noise resides. Any signal content outside the selected Range will not be affected by the De-Noiser.
3. Move the Gain faders to shape the noise reduction:
    - If a negative Gain is selected, then EQ is applied to suppress the 'noise' when the level of the input is below the Threshold.
    - If a positive Gain is selected, then EQ is applied to boost the 'signal' when the level of the input is above the Threshold.

Enhancer

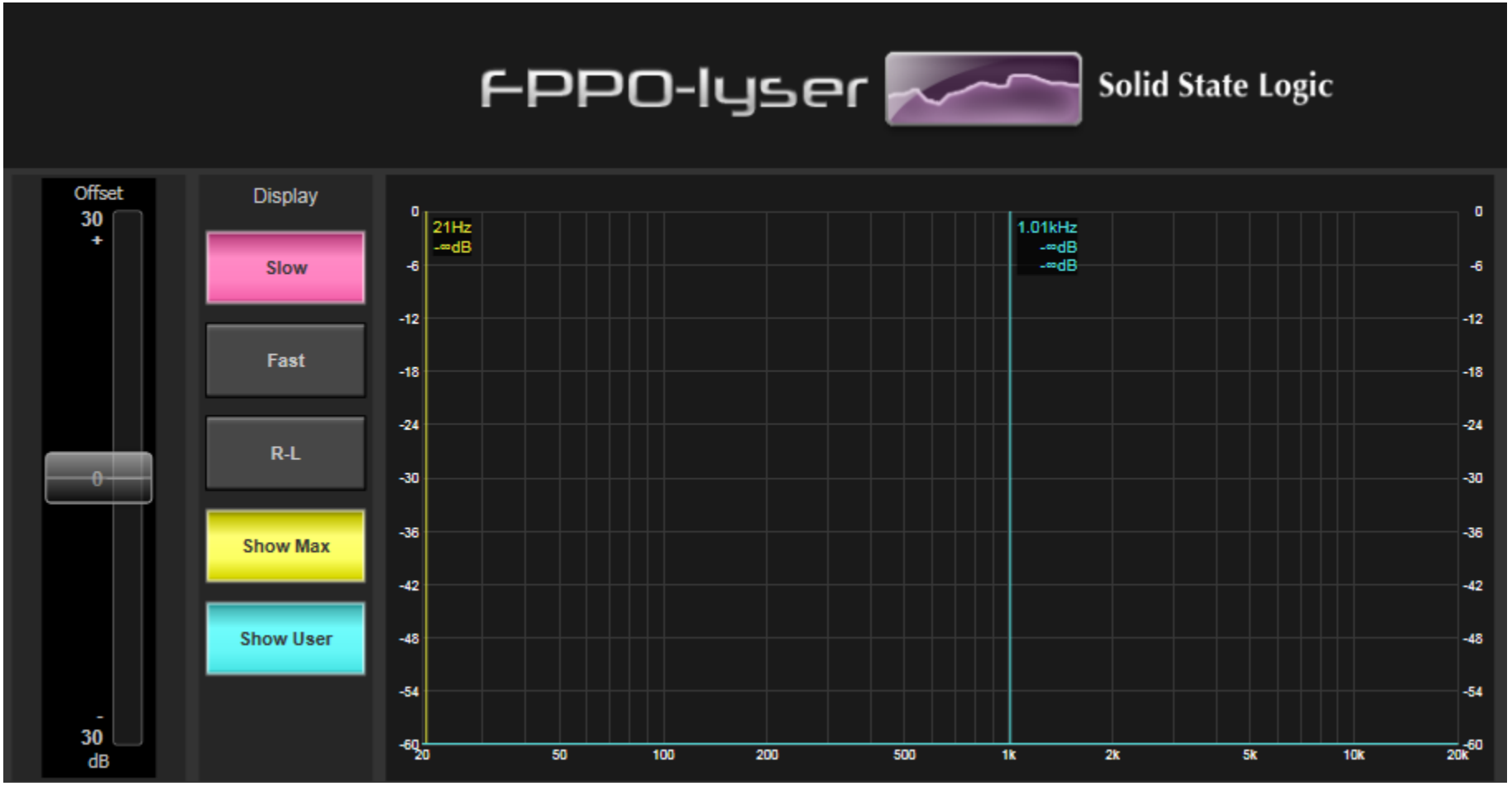
HF and LF controls enhance the harmonic content of those frequency ranges;

Cutoff defines the frequency range limit;
Drive controls how much harmonic reaction there is within the drive signal;
Amnt is simply the amount of that range fed back into the mix.



Audio Tools

FPPO Analyser (Mono/Stereo)



The analyser is a fixed point per octave analyser, rather than an FFT linear analyser, allowing greater resolution at low frequencies:

Use the Show Max button to display a set of crosshairs at the maximum amplitude detected.

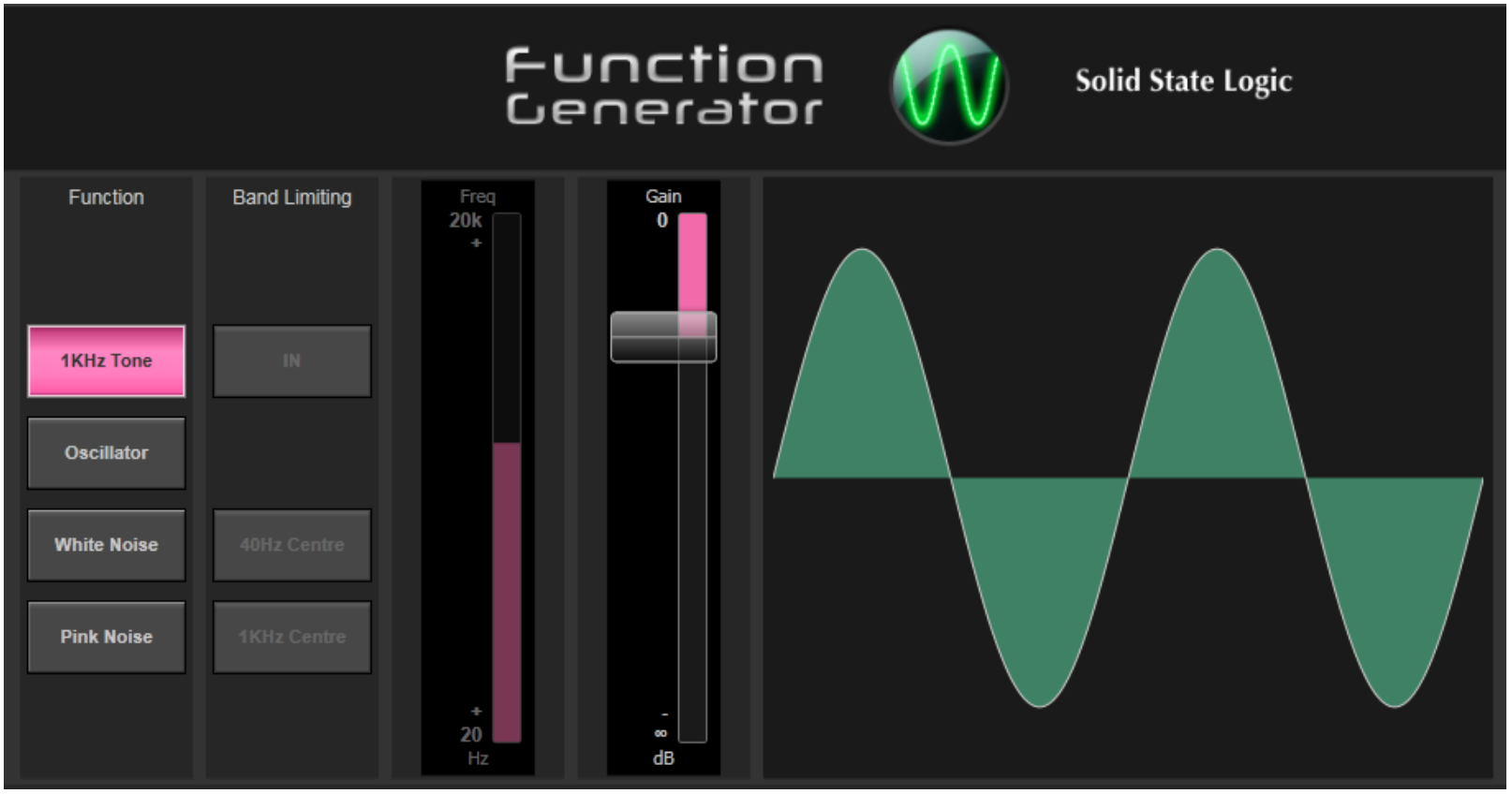
Use the Show User button to display a set of crosshairs at a user defined frequency. Tap the graph or use the encoder beneath the screen (in Follow Detail Mode) to set the frequency.

The R-L button is only available in the stereo version of the module and shows the difference between Left and Right channels. These can be routed to two separate signals for comparison.

Function Generator (Mono)

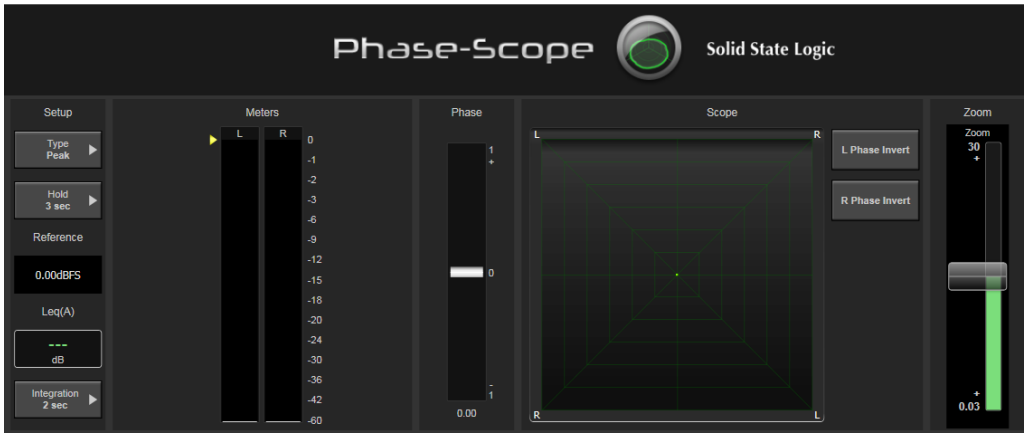
The Function generator provides an oscillator of variable frequency, with a fixed option of 1 kHz, in addition to white noise and pink noise generation:

Band Limiting section provides band filtered pink noise. These are two octaves wide centred around 40 Hz and 1 Khz and are intended for simple 5.1 speaker calibration using a C weighted (slow) SPL meter.



Phase/Jellyfish-Scope (Stereo/LCR)

Stereo



LCR

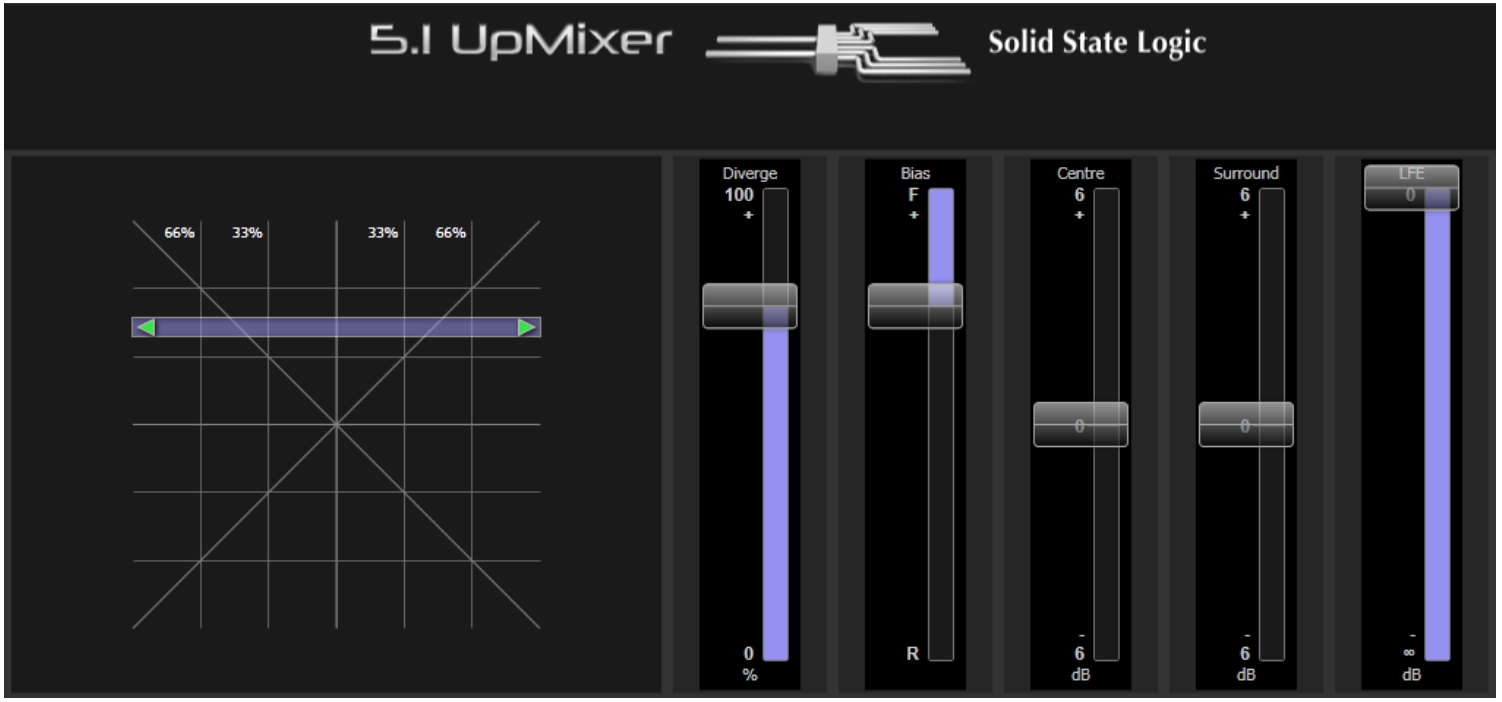
The stereo and LCR Phase Scope modules allow the phase of two or three sources to be compared in real-time.

Type: Set Peak or RMS sensing.
Hold: Set the detector hold time to 3 seconds, 10 seconds, Infinite or None. There is also an option to RESET the hold indicator.
Reference: Set the reference measurement level.
Integration: Set integration time to 1seconds, 2 seconds, 10 seconds, 30 seconds, 1 minute, 2 minutes or Infinite.

There is also an option to RESET the integration time.

5.1 UpMixer

Module Format: 5.1 Only



The module can be placed in the insert point of a 5.1 channel, stem, or master. When active, any stereo signal routed to the path will be up-mixed to 5.1. The path's panning is still active, so the upmixed 5.1 signal can be further modified via the width and depth controls. When used on Stems or Outputs, these act as dedicated stereo upmix paths, if a normal 5.1 signal is routed to the path with the insert on, the C, LFE, Lrs and Rrs channels are removed.

No delays are involved in the upmix process, so the resulting 5.1 signal can be down mixed back to stereo with no unpleasant artifacts and with only very subtle differences compared to the original source.

The main controls are the divergence and bias controls. Divergence controls the spread of the front soundfield. The default is 75%, reducing this further decreases the mono component sent to the centre speaker so that at 0% divergence, it is effectively a 4.0 upmix.

Bias controls the perspective of the soundfield with 75% as a good starting point. Full rear bias places the main image behind the listening position and is useful for applause and ambience signals. For any setting of bias and divergence, the centre and surround signals can be trimmed by up to ± 6dB.

LFE level sets the amount of the L+R signal sent to the LFE channel.

Divergence is indicated by a 'width' style display. Bias by vertical positioning of the divergence bar. The Trim sliders are centre pivot.

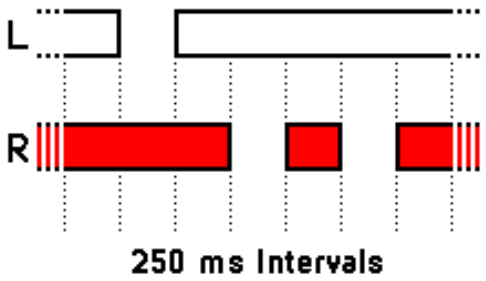
Stereo Tone Generator

Module Format: Stereo Only

The module is generates a two channel tone sequence which will identify the left and right channels of the stereo signal. The primary use is to replace the main mix output so that any audio process downstream of the console can check if a channel reverse has occurred in the signal transmission path.

The module generates two different identification patterns.

GLITS Tone
GLITS tone comprises a 1 kHz tone, at the lineup level defined by the user via a text box on the GUI (default -18dBFS), on both channels, with interruptions which identify the channels. GLITS tone is used on C10 and C100.



The left channel is interrupted once for 250 ms every 4 seconds. 250 ms later the right channel has two interruptions of 250 ms spaced by 250 ms.

EBU Tone

The EBU Technical Document 3304 describes a line up tone that identifies the Left stereo, or channel 1, by means of interrupting a 1 kHz tone at the alignment level for 250 ms every 3 seconds.

This interruption enables phase relationships to be audibly checked, as well as checking and identifying the monophonic mix.

There will be three level options for the tone signal used in GLITS and EBU module, the default line up level as defined by the user via a text box control on the GUI, a +9dB option, permitted maximum level (PMS), and a -12dB Measurement signal (MS). PMS and MS options are relative to the line up level.

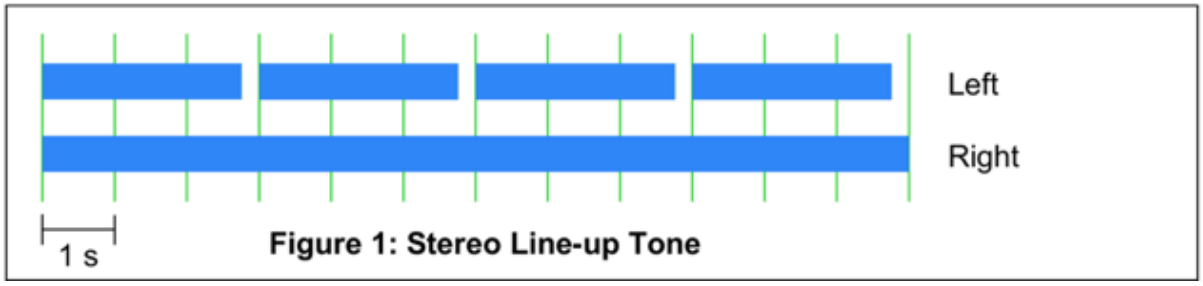
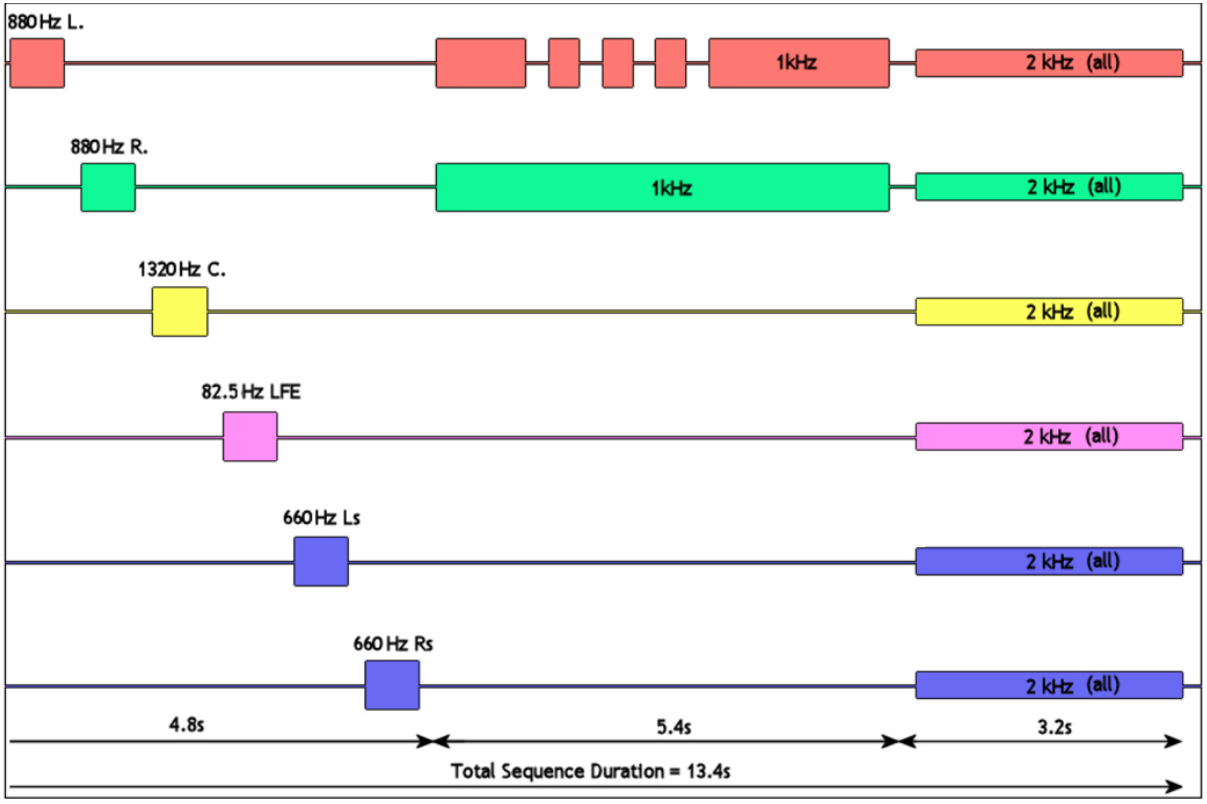


Figure 1: Stereo Line-up Tone

5.1 Tone Generator

Module Format: 5.1

This module generates BLITS tone which is used extensively to identify 5.1 transmission feeds.



BLITS Signal Timings
The sequence is composed of three distinct sections, as follows.

Section 1: 5.1 Idents section, various frequencies @ line up level
Each channel is identified by a tone burst of 600ms duration, with a spacing of 200ms between tone bursts, followed by 200ms of silence. This sequence runs from 0.00s > 4.80s (i.e. duration = 4.80s).

Section 2: "Stereo" ident section, 1 kHz @ line up level
The right channel is a continuous tone burst of 5.1s duration.
The left channel is a discontinuous tone burst. The breaks in the left channel are at 1s, for 300ms, then on-and-off for 300ms, three more times, followed by 2s of steady tone.

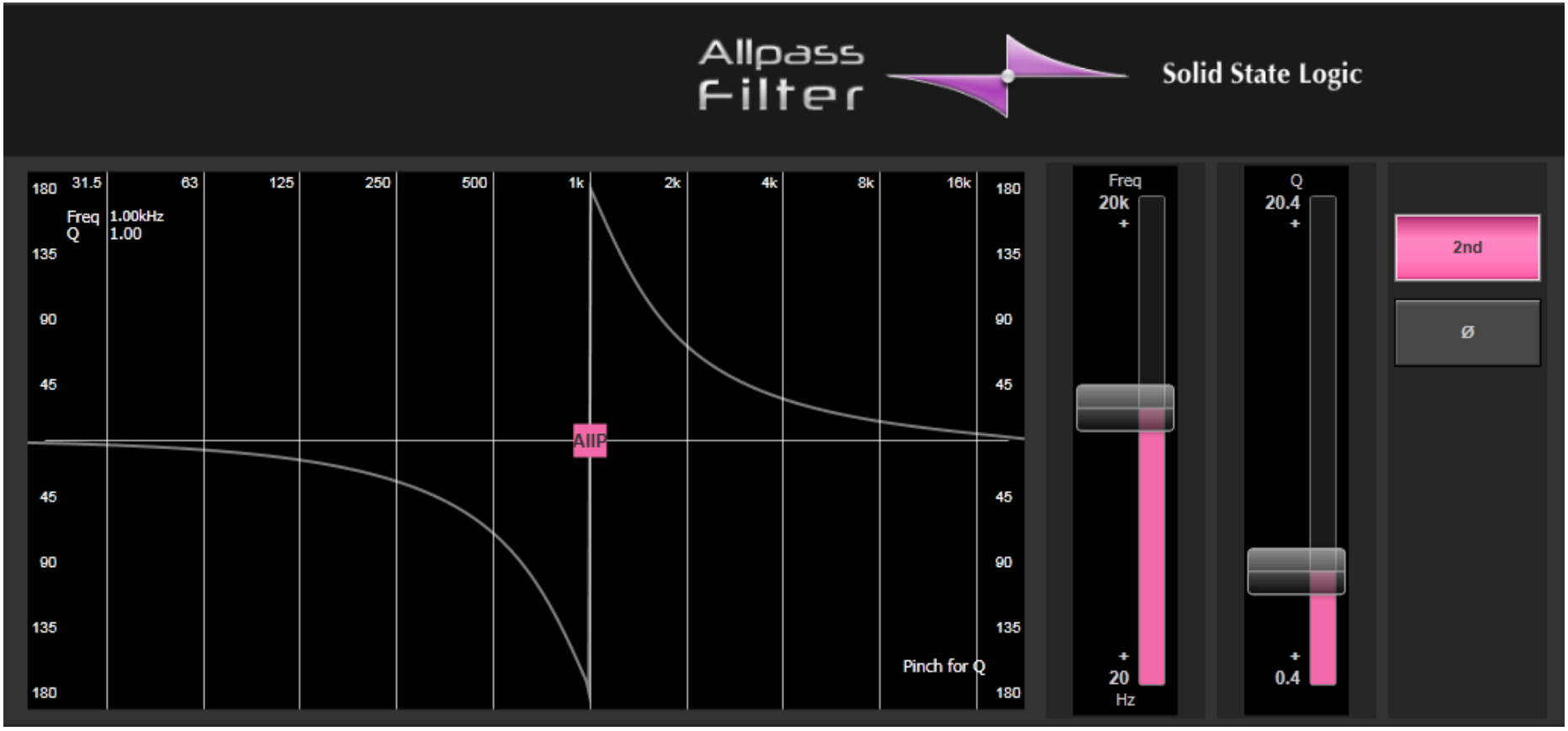
Then silence for 300ms on both left and right channels.

This sequence runs from 4.80s > 10.20s (i.e. duration = 5.40s).

Section 3: Phase-check section, 2 kHz @ line up level - 6dB
All channels contain 3s of in-phase 2kHz tone, followed by 200ms of silence.
This sequence runs from 10.20s > 13.40s (i.e. duration = 3.20s).
The total duration of a complete BLITS sequence is therefore 13.40s.

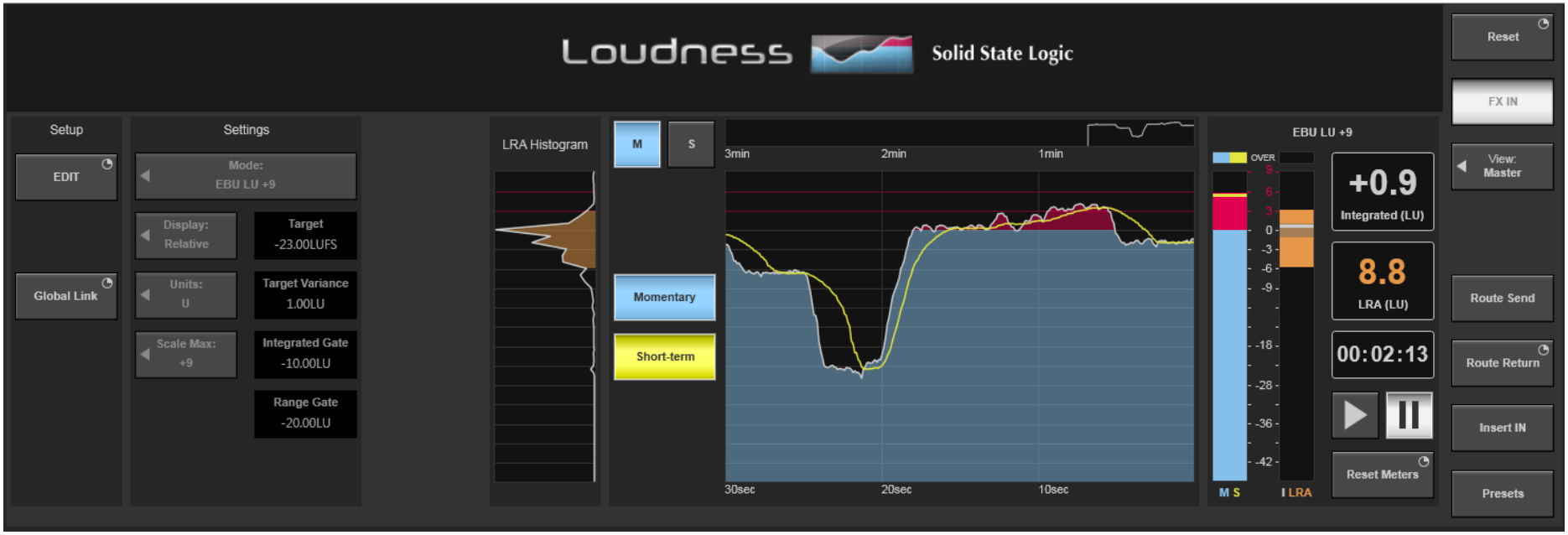
- Three buttons select the ident segments - **5.1**, **Stereo** and **Phase Check**.
- Loop triggers the ident which repeats continuously (there is silence at the end of the segments so an additional silence before the retriggering the ident is not required). Loop automatically activates the Generate button.
- **Generate** triggers the Ident.
- **Reset** restarts the sequence from the beginning (Requires Generate and Loop to be active - this does nothing if Loop is not on).
- A progress bar indicates the current position in the selected segments that are playing.
- A textbox for setting the Alignment level.

All Pass Filter



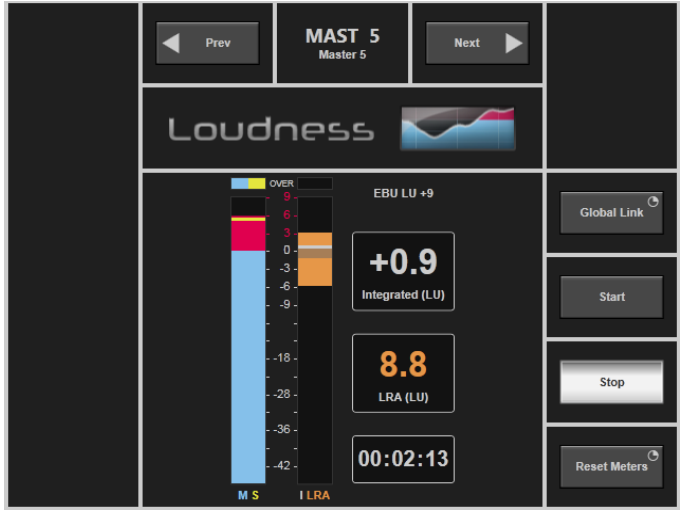
Define the filter type using the 2nd Order and All Pass ø buttons.

Adjust the AllP node within the graph using a finger or a mouse.
To change the Q (when in 2nd order), use two fingers and draw them together or apart.
The filter's Q and centre frequency are shown in the top left of the graph.



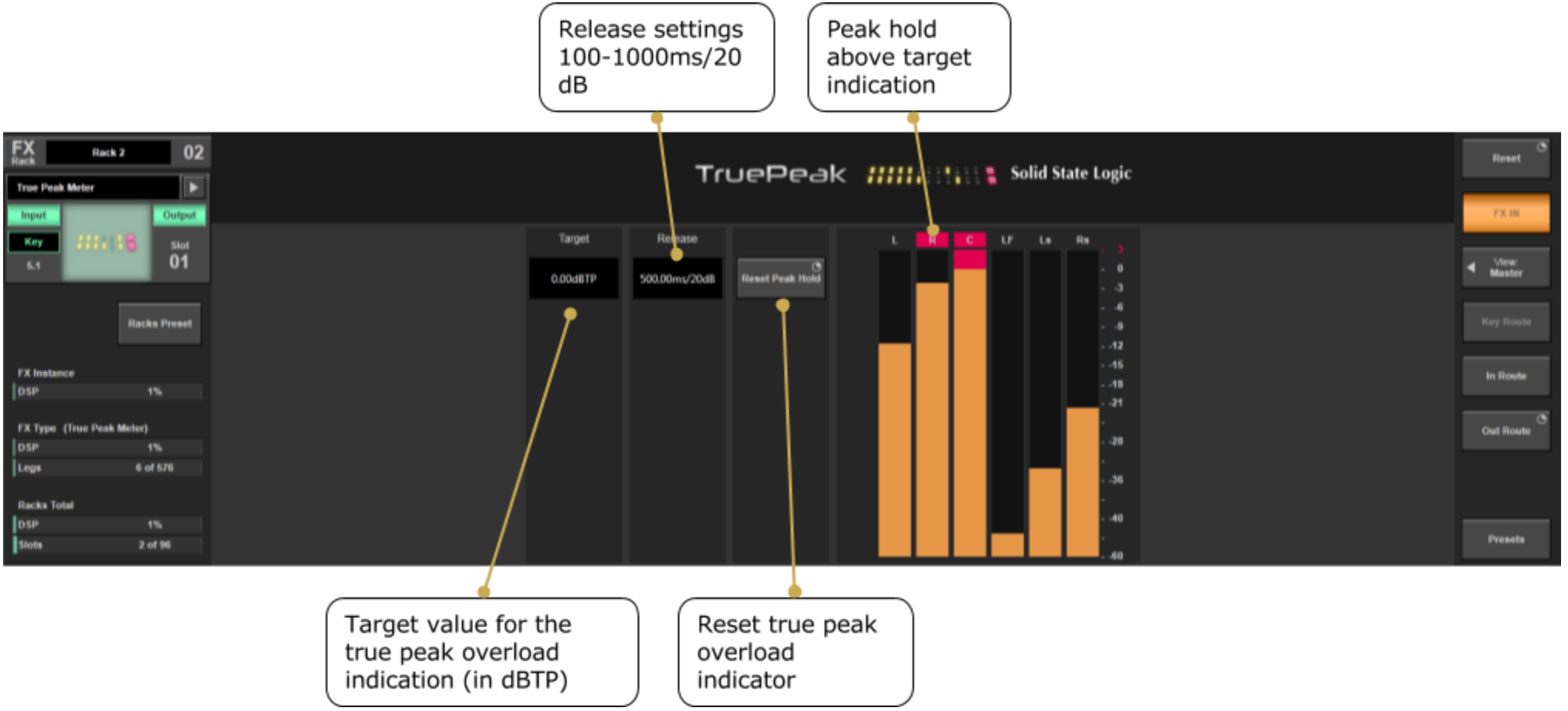
Loudness Meter Effects rack Plugin

The Effects rack includes a loudness meter plugin, it is found in the "5.1 Effects" in the "tools" group. The FX rack slot can be freely routed to be viewed in the effects rack, or placed in the insert send of any channel or bus to be visible in the channel detail view on the main screen or the small screen. The meter supports +9 and +18 Absolute and Relative scales for the following standards: EBU, ATSC A/85 and ARIB TR-B32.



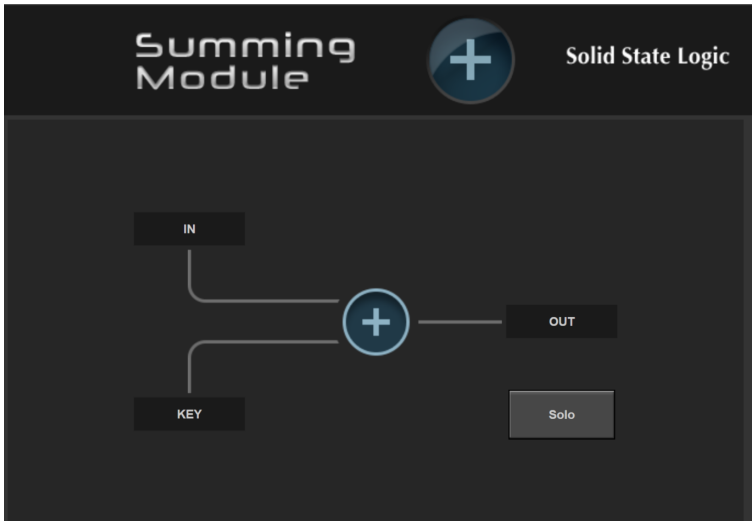
True peak meter (FX rack)

A True Peak meter is included in the tools menus in the Effects rack, this is available as mono, stereo, LCR, 4.0 and a 5.1 effect and becomes a routable object within the routing GUI once added to the FX racks.



Summing module

The FX rack now includes a summing module which is available for all formats of FX modules. The main "input" and the "key" input are summed together. The solo button routes the summing modules output to the misc solo bus for that particular FX rack for confidence monitoring of the summed output.



Overview Screen

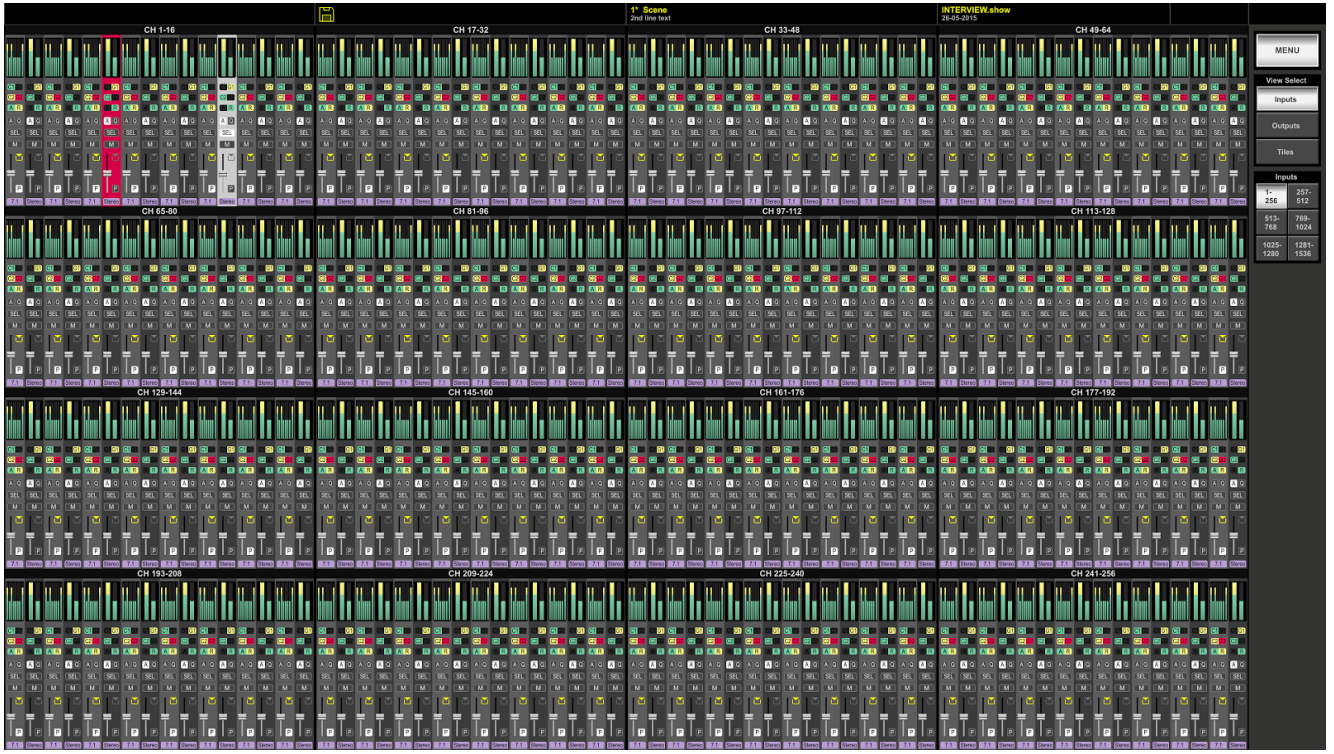
Visible Channel Elements

Upper Indicator group

C1/C2 show compressor gain reduction with a variable Green intensity to 6dB, then changing from Green to Orange from 6 to 12dB, then red for anything >12dB. If the Compressor is out of circuit blank.
G1/G2 indicate Gate state - Green - open, Red - Closed, Orange - Transition. Also blank if not in circuit.
If the de-Esser is active, variable intensity blue replaces the compressor indication.
R is an indicator for Remote control
A indicates that the Automix function is active.

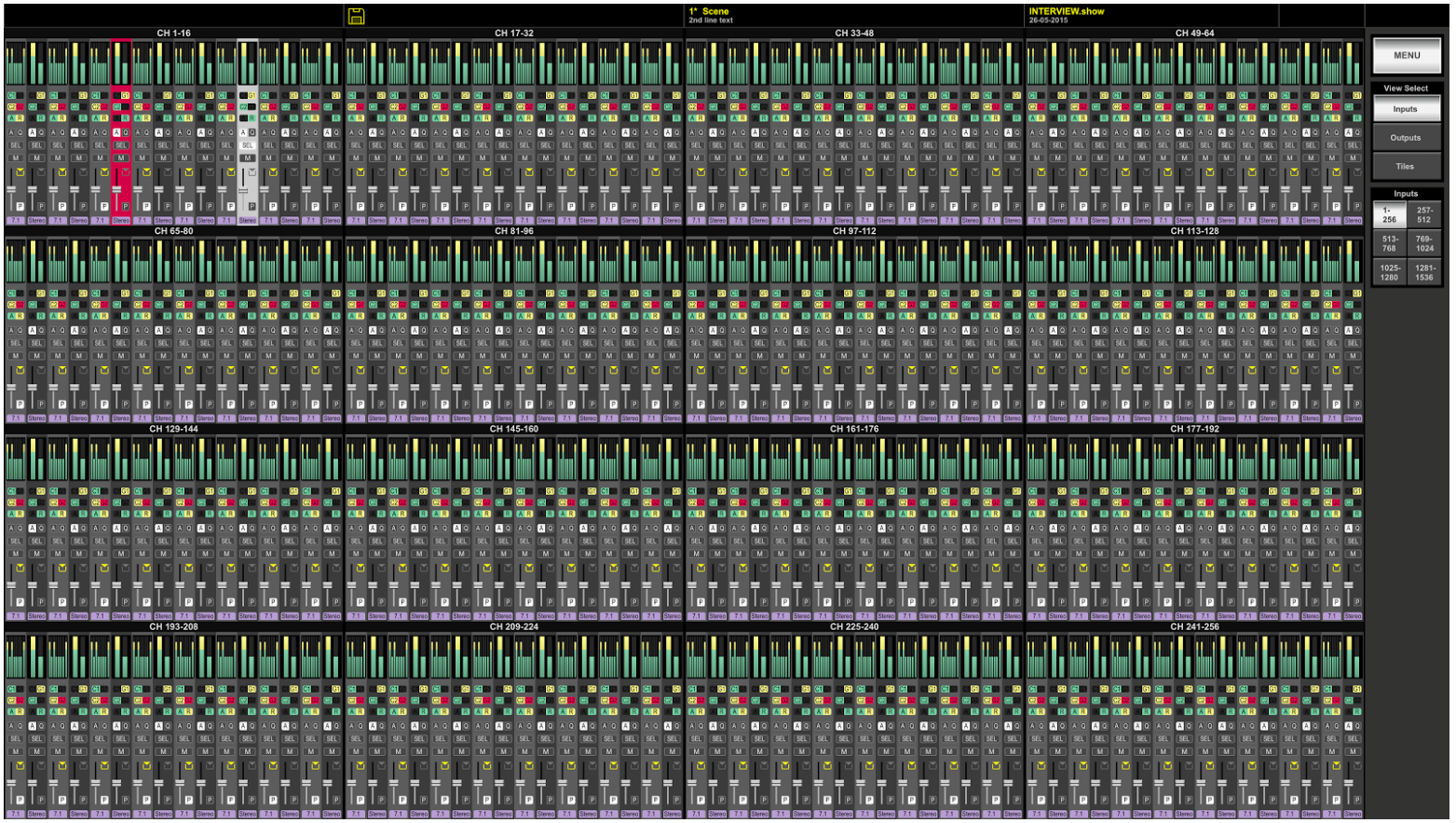
Lower Indicators

A indicates AFL.
Q indicates Queried.
SEL is the currently selected path.
M indicates if a path is muted.
P indicates PFL.



Inputs View

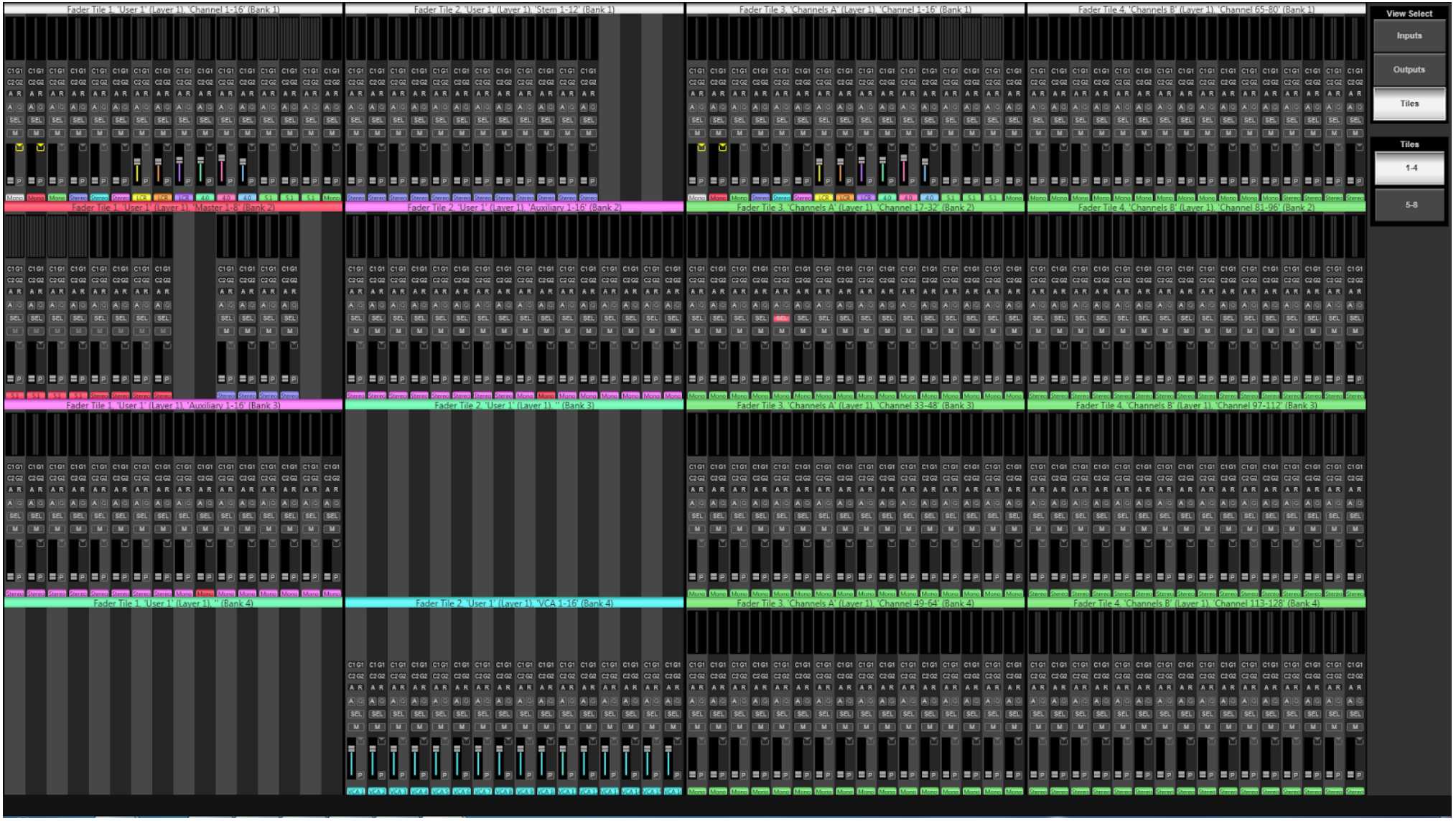
The path type to be shown can be selected from the sidebar, and the path instances can be paged through using buttons.



Outputs View

Overview - Tile View

In addition to the Inputs view and outputs view, the overview screen can be put into a tile view mode. In tile view the vertical columns show all the banks in the active layer on each tile (upto 4 fader tiles). The active bank in each column representing the layers is shown with it's heading in white.

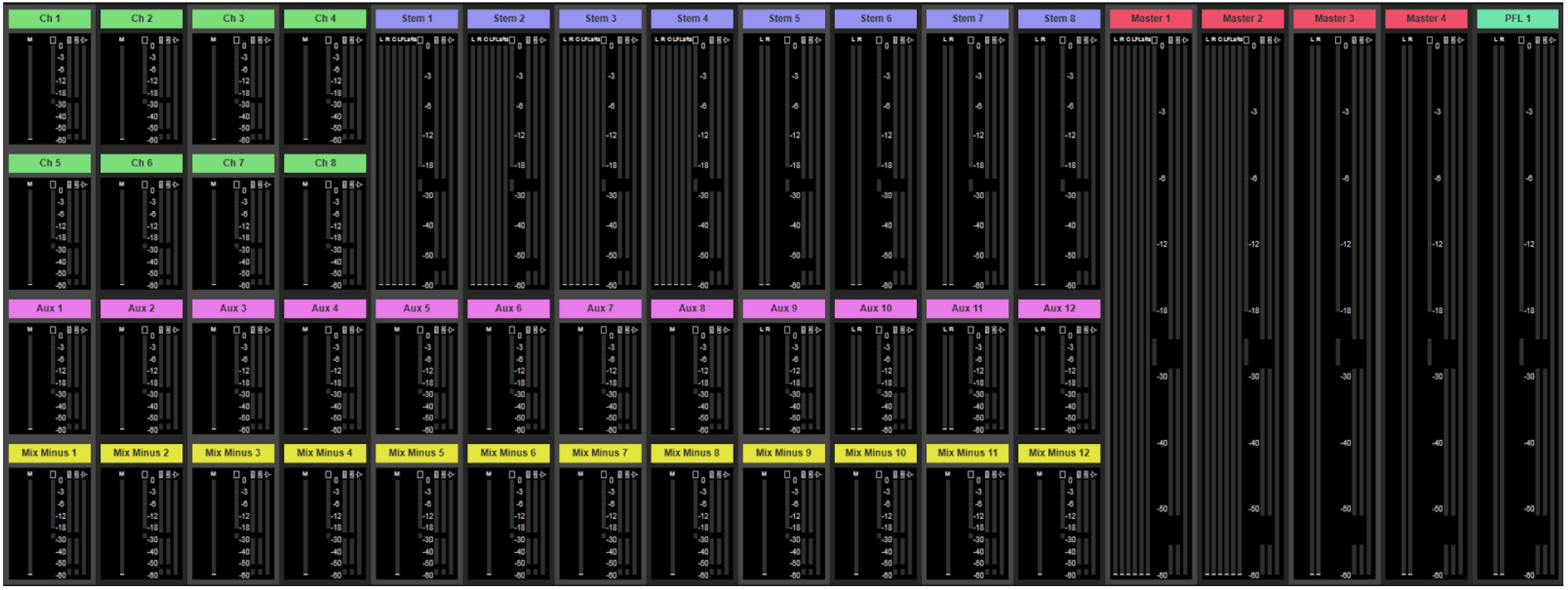

Fader Tile 1 'User 1' (Layer 1) 'Channel 1-16' (Bank 1)
Fader Tile 2 'User 1' (Layer 1) 'Stem 1-12' (Bank 1)
Fader Tile 3 'Channels A' (Layer 1) 'Channel 1-16' (Bank 1)
Fader Tile 4 'Channels B' (Layer 1) 'Channel 65-80' (Bank 1)
Fader Tile 1 'User 1' (Layer 1) 'Master 1-8' (Bank 2)
Fader Tile 2 'User 1' (Layer 1) 'Auxiliary 1-16' (Bank 2)
Fader Tile 3 'Channels A' (Layer 1) 'Channel 17-32' (Bank 2)
Fader Tile 4 'Channels B' (Layer 1) 'Channel 81-96' (Bank 2)
Fader Tile 1 'User 1' (Layer 1) 'Auxiliary 1-16' (Bank 3)
Fader Tile 2 'User 1' (Layer 1) '' (Bank 3)
Fader Tile 3 'Channels A' (Layer 1) 'Channel 33-48' (Bank 3)
Fader Tile 4 'Channels B' (Layer 1) 'Channel 97-112' (Bank 3)
Fader Tile 1 'User 1' (Layer 1) '' (Bank 4)
Fader Tile 2 'User 1' (Layer 1) 'VCA 1-16' (Bank 4)
Fader Tile 3 'Channels A' (Layer 1) 'Channel 49-64' (Bank 4)
Fader Tile 4 'Channels B' (Layer 1) 'Channel 113-128' (Bank 4)
View Select
Inputs
Outputs
Tiles
Tiles
1-4
5-8

Meter Bridge

Meter Bridge config from console

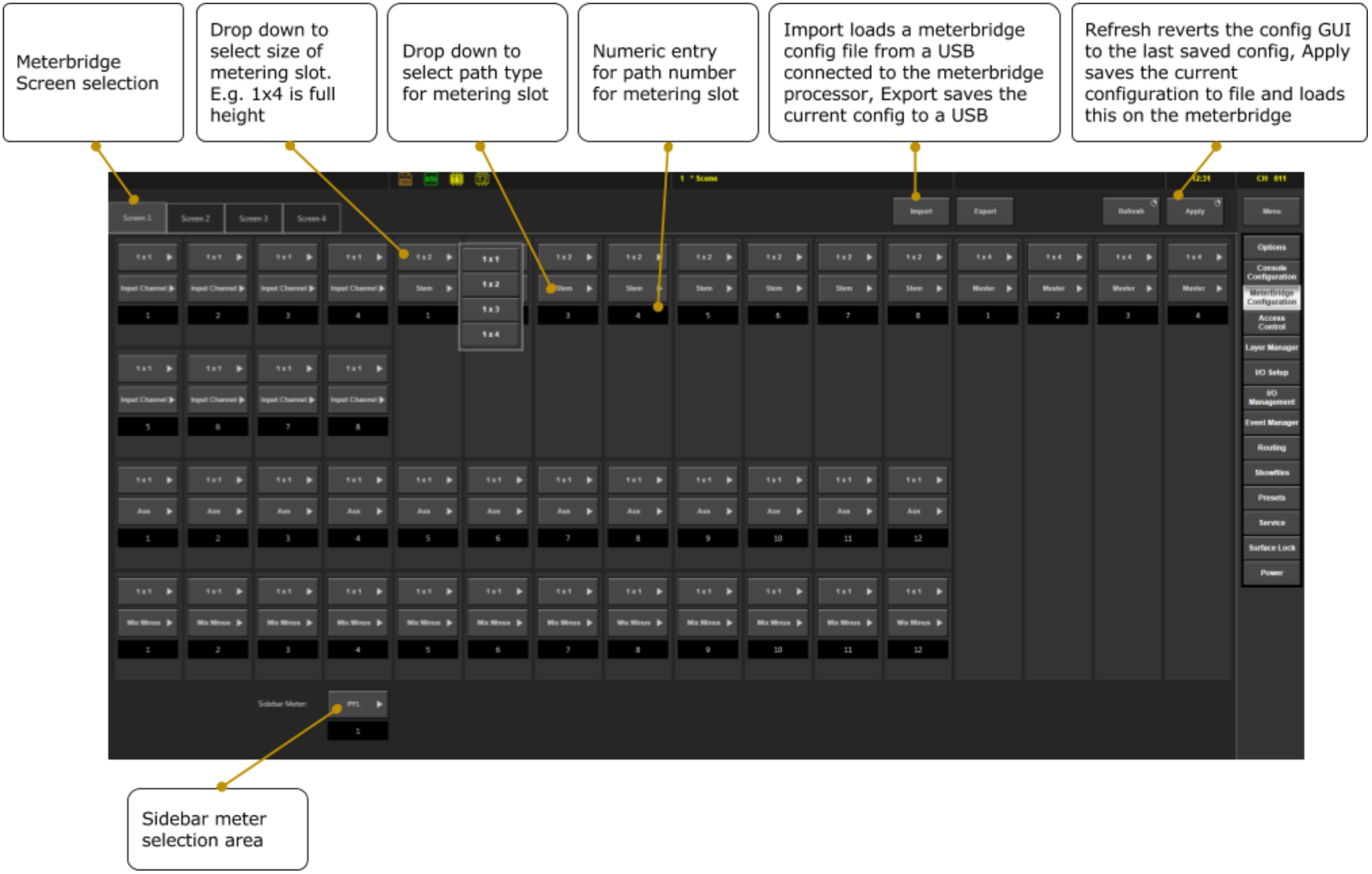
For consoles fitted with a Meter Bridge a menu to assign paths to slots on the Meter Bridge is accessed in **Setup/Meter Bridge Configuration.**

Each Meter Bridge screen is divided up into 16 slots across, each capable of being divided up into 4 vertical slots. For general configuration starting from the top left slots are configured to be 1x1 to 1x4. In addition to the 16 vertical slots there is a side bar meter (that is always full height) on the right hand side. All sizes of metering slot automatically show the same info displayed on the channel view meters, displaying the path name with the path colour assigned from the Eyeconix channel detail view. Metering for each mono leg within any formatted path is shown, allowing you to quickly determine source audio format. Dynamics reduction and gate traffic light indication is shown for both dynamic 1 and dynamics 2. The Automix meter is shown on every channel and the overall fader level, including contribution of any VCA faders is shown in blue on the right hand side. Other indication including channel clipping and IO device offline is also shown on the Meter Bridge.



Each Meter Bridge screen is divided into 64 path metering slots and 1 sidebar meter. Each slot has any path assigned to it. The Meter Bridge config is not part of the showfile, if a path doesn't exist in the showfile that is loaded then the slot will be blank providing a clearer view of the used resources.

Meter Bridge configuration screen



Automation

The System T real time automation system allows you to store and recall snapshots ('Scenes') of the console's settings. These can be recalled ('fired') manually, or via external GPIO triggers.

Filter matrices allow you to determine what elements of the console are stored and recalled as part of each scene, allowing you to choose the level of real-time control within the event.

Each Scene can also be used to trigger external events via GPIOs.

Basic automation control and indication is found in the **Automation** area of the Master Tile. More advanced Automation controls and indication are available in the **Automation** screen, opened via the **Menu** button.

Show and Theatre Modes

The Automation system has two modes of operation which define what happens when the arrow buttons in the **Automation** Panel are used to scroll the list of Scenes:

If **Show** mode is active, Scenes are only 'Selected' (highlighted) by the arrow buttons. The Selected Scene then has to be fired using the **Go** button to the right of the arrow buttons.
If **Theatre** mode is active, Scenes are automatically fired when they are selected with the arrow buttons. In Theatre mode, the **Go** button duplicates the down arrow.

Switching between Show and Theatre modes is via the **Theatre** or **Show** button in the **Controls** detail view in the Automation **Scene View**
The mode is also indicated below the **GO** button in the sidebar on the right edge of the Automation screen.

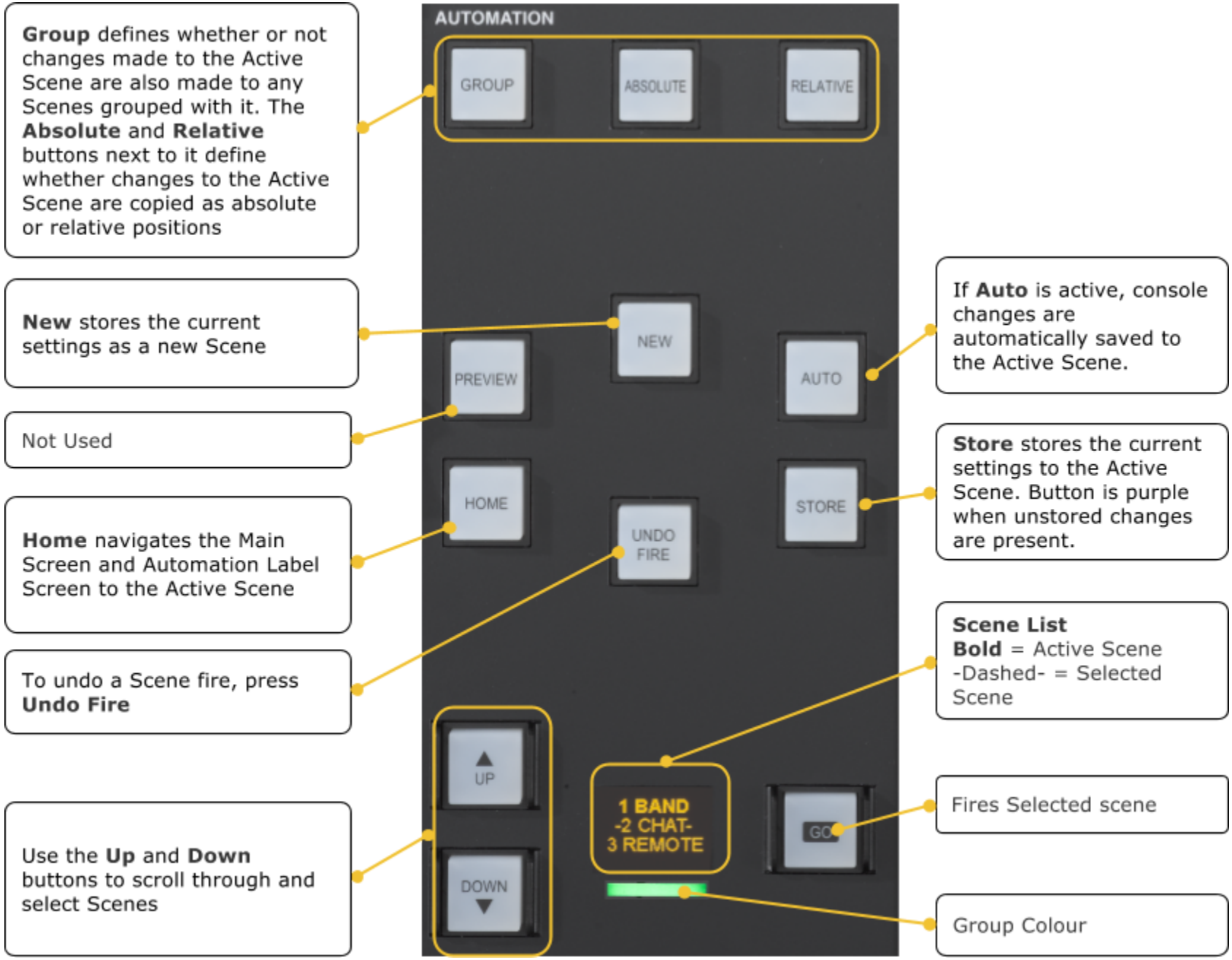
When in **Show** mode the **Go** button will light cyan.

When in **Theatre** mode the **Go**, **Up** and **Down** arrow buttons will light green to indicate that pressing the buttons will fire the next/previous scene without needing to confirm the recall by pressing the **Go** button.

Master Tile Controls

Note: The control description assumes 'Show' mode. In 'Theatre' mode the **Up** and **Down** arrows fire the scene, and the **Go** button duplicates the Down button function.

All these controls are duplicated in the **Scene View Controls** detail view.


Group defines whether or not changes made to the Active Scene are also made to any Scenes grouped with it. The **Absolute** and **Relative** buttons next to it define whether changes to the Active Scene are copied as absolute or relative positions
New stores the current settings as a new Scene
Not Used
Home navigates the Main Screen and Automation Label Screen to the Active Scene
To undo a Scene fire, press **Undo Fire**
Use the **Up** and **Down** buttons to scroll through and select Scenes
AUTOMATION
GROUP
ABSOLUTE
RELATIVE
NEW
PREVIEW
AUTO
HOME
UNDO FIRE
STORE
UP
DOWN
1 BAND
-2 CHAT-
3 REMOTE
GO
If **Auto** is active, console changes are automatically saved to the Active Scene.
Store stores the current settings to the Active Scene. Button is purple when unstored changes are present.
Scene List
Bold = Active Scene
-Dashed- = Selected Scene
Fires Selected scene
Group Colour

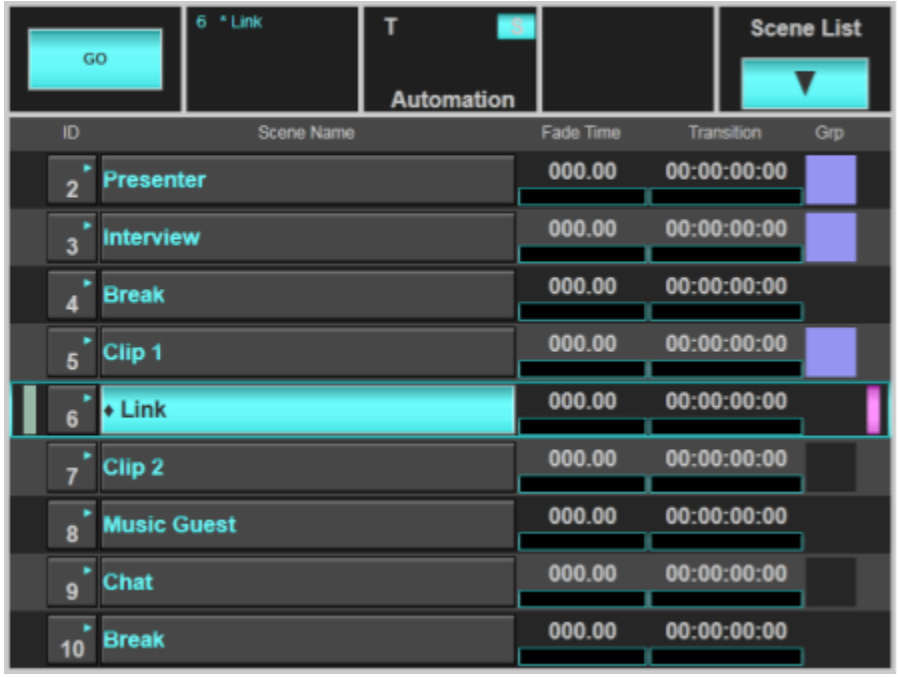
Channel Tile Automation View

It is also possible to view the Scene List on the Channel Tile screen:
Press the **Home** button on the Channel Tile then select **Automation** from the Home screen.

The Channel Tile Automation screen has two display modes, chosen using the **Scene List** button in the top right corner of the screen; one shows the Scene List, complete with Scene Names and IDs, Group colours, Fade and Transition Times (as below).

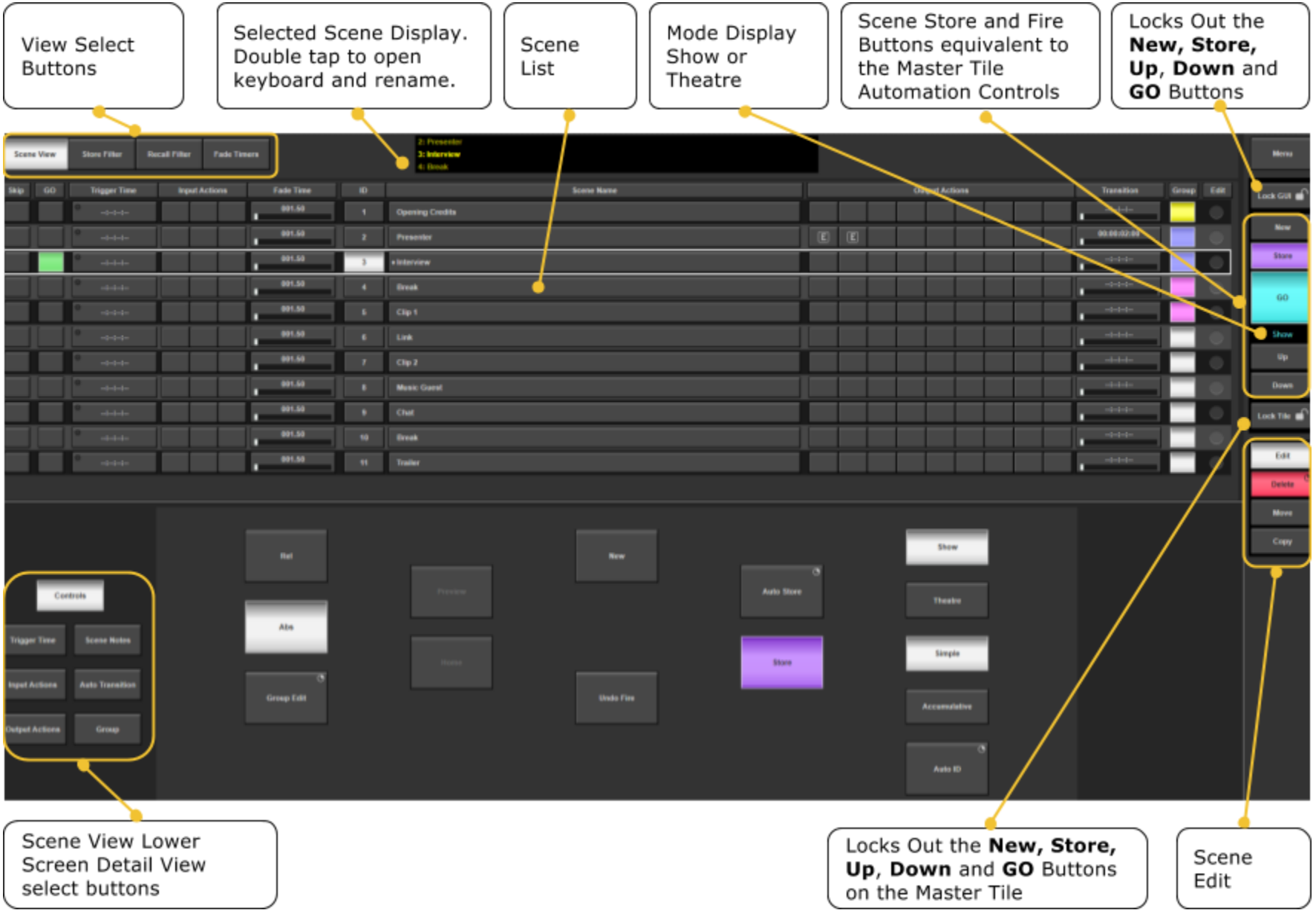
The other view displays the currently Active Scene and its associated notes in the top half of the display. The lower half of the display shows the next Scene and its notes.

The Cyan Sidebar indicated that the current state of the console is different from the state saved in the Active Scene. This is also shown on the **Store** button on the Master Tile and in the Automation Screen.

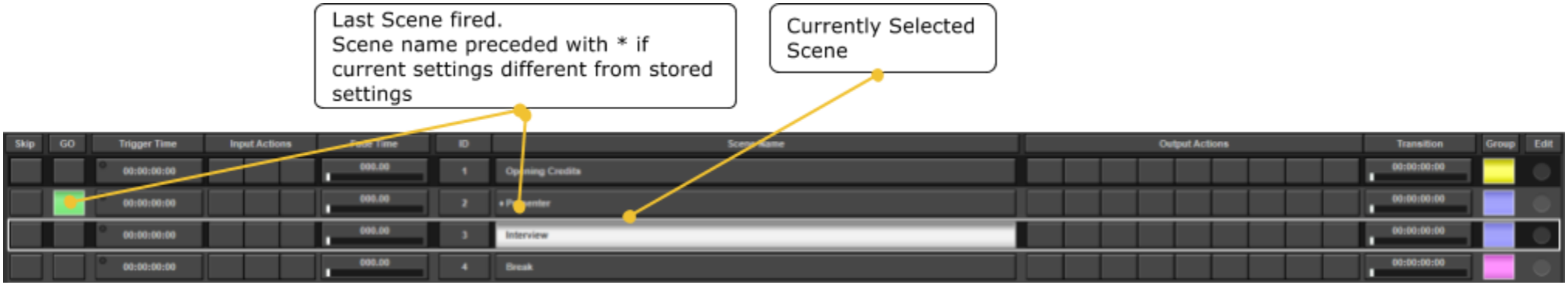


Automation Screen Overview

The top half of the Automation screen displays the Scenes List, while the bottom half displays the 'Detail dialogue' for the currently Selected Scene.


View Select Buttons
Selected Scene Display. Double tap to open keyboard and rename.
Scene List
Mode Display Show or Theatre
Scene Store and Fire Buttons equivalent to the Master Tile Automation Controls
Locks Out the **New, Store, Up, Down** and **GO** Buttons
Scene View Lower Screen Detail View select buttons
Locks Out the **New, Store, Up, Down** and **GO** Buttons on the Master Tile
Scene Edit

The Scene List



The following functions are available for each Scene via the columns of the Scene List. These are described in detail in the following pages.

Skip Causes the Scene to be skipped when when triggered in sequence. Tap the column header to enable/disable the function.

GO Recalls the Scene to the console, making it the Current Scene. Tap the column header to enable/disable the function.

Trigger Time allows Scenes to be triggered automatically when the incoming timecode reaches a specific value. *Requires an external LTC/MTC timecode interface. Contact an SSL dealer or representative for more information.*

Input Actions Enables GPI triggers to recall the scene. Tap the column header to enable/disable the function. First tap disables the currently selected column. Second Tap disables all Input actions.

Fade Time defines the speed at which settings fade from the previous Scene to the new Scene. Crossfade times are set via the Fade Timers page and cross fade progress indicated via the horizontal bar. Tap the column header to enable/disable the function.

ID Indicates the Scene's position in the Scene List.

Scene Name Indicates the Scene's user editable name. To name a Scene, touch its row in the Scene List. It will be shown preceded by the ID number and highlighted in box above the the Scene column. Double-tap the box, and replace the name using the keyboard which appears.

Output Actions Fires GPI Events when the scene is recalled. Tap the column header to enable/disable the function. First tap disables the currently selected column. Second Tap disables all Output actions.

Transition defines how long a Scene last before automatically moving onto the next Scene in the display. You can prevent a Scene from being triggered as part of a sequence by activating its **Skip** box.. A horizontal bargraph indicates the elapsed scene time. Selecting the Transition Time box automatically selects the **Auto Transition** detail view for entering times. Tap the column header to enable/disable the function.

Group Defines what edit Group each Scene is part of, if any. Tap the column header to enable/disable the function. First tap enables all scenes for Group editing regardless of their current Group assignment. Second Tap disables Group Edit updates.

Scene Notes

To add notes, select the **Scene Notes** Detail Dialogue from the **Scene View,** double-tap inside the text box and type notes using the keyboard which appears.

Scene IDs

The Auto ID button in the right side of the Controls Detail Display defines what happens to ID numbers when the Scene list is re-arranged:

- When the button is active, the ID column is simply renumbered to stay in order.
- When the button is inactive, Scene IDs will not change when Scenes are re-ordered; if new Scenes are placed in between old ones, their IDs will increment upwards from the Scene before, using decimals if necessary to prevent their IDs from matching the Scene after. Pressing (and holding) the **Auto ID** button can then be used to renumber the Scenes in order.

Scene List Editing

The final column in the Scene List is used for editing the List itself. To delete, move or copy & paste Scenes:

Enable the Edit function by touching the **Edit** button in the centre of the function button column of the right hands side of the screen.
Touch the round **Edit** indicator at the end of a row to select the row – the indicator will go red to indicate that its row is being edited.
Multiple rows can be selected. You can also select the complete set of rows or columns by touching the **Edit** label itself.
The three edit functions listed below the Edit button will now be available: **Del** (Delete), **Move** and **Copy**.

To delete Scenes, touch their Edit indicators so that they go red, then press & hold the **Del** button.
Note: The Active Scene cannot be deleted.To move Scenes, touch their **Edit** indicators so that they go red;

Touch the **Move** button – it will go blue to indicate that it is active;
Now touch the Scene which is in the position you wish to put the Moved Scenes. The Scenes will be placed above the Scene you touched.
The Scenes will move to the new location. The other Scenes will move to close up any gaps.
If you wish to change the location again, simply touch the location you wish to move them to, and the Editable Scenes will move again.
Touch **Move** again to disengage the move function.

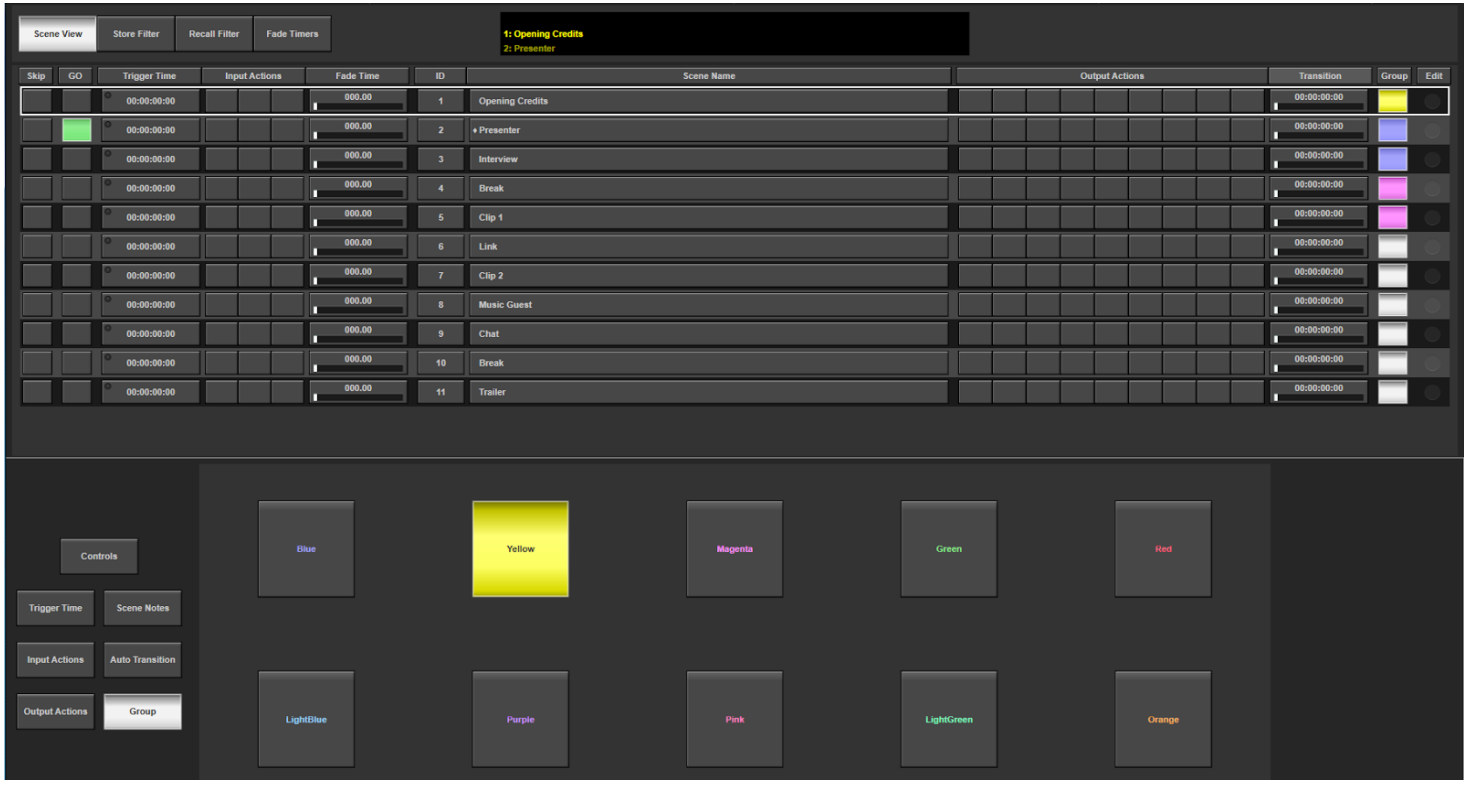
To copy Scenes, touch their **Edit** indicators so that they go red;
Touch the **Copy** button – it will go blue and become a **Paste** button.
Now touch the Scene which is in the position you wish to paste the new Scenes.
The Scenes will be duplicated at the new location, with the word **Copy** appended to their names. The other Scenes will move to create space for them.
You can paste the copied Scenes to more locations using the same technique.
Touch **Paste** again to disengage the copy+paste function.
You can rename the copied Scenes in the usual way.

Scene Groups

If you want changes made to the Active Scene to be reflected in a selection of other Scenes (or all Scenes), those Scenes can be placed in a Scene Group. Whenever you make changes, you can select whether or not to make those changes across all Scenes in the Group, and whether or not those changes should be relative to each scene's previous values or absolute across all scenes in the group. Scene Groups are distinguished by their colours.

Creating Groups

To place Scenes into a Group:
Touch the Grp column for one of the Scenes to be Grouped. The Group configuration page will open in the bottom half of the screen.



Touch one of the coloured boxes which appears. This is now the colour for that Scene Group, and it will appear in the Scene List Grp box for that Scene.
The colour bar above the Automation LCD in the Master Tile will also light to show the Group colour of the currently selected Scene.
Repeat the process for all other Scenes to be put into that Group, selecting the same colour each time.
To create another group, simply repeat this process with a different colour.

Group All Mode

To apply changes to all Scenes, tap the Group column heading until it turns green. All Scene Group buttons will turn cyan. This will override any specific colour groups and propagate changes to every Scene in the list.

Enabling Group Changes

The **GROUP** button in the Automation area of the Master Tile defines whether or not changes made to the Active Scene are also made to any Scenes grouped with it.

Press the **GROUP** button to activate Group mode. The button will flash in the colour of the Group being worked on (i.e. that of the Active Scene; or cyan if in Group All mode). The active Group's Scene List Grp boxes will also 'light' when the group is active. Any changes made from the point at which Group mode was engaged will be applied to the Active Scene and all scenes in the Group when the Store button is pressed, which will light yellow to indicate when Group changes are pending.

Alternatively, press & hold the Group button to carry over all changes made in the Active Scene to the Grouped scenes when pressing Store, i.e. changes made both before and after the Group button was engaged.

Whenever the Group button is unlit, changes stored to the Active Scene will only affect that Scene.

When the Group button is active, the **ABSOLUTE** and **RELATIVE** buttons next to it define whether changes to the Active Scene are copied as absolute positions (the new position in the changed Scene becomes the new position in all the grouped Scenes) or as relative positions (each grouped Scene is changed up or down by the same amount).
For example, a fader is at -6dB in the Active Scene and at -20dB in a Scene within its Group. If that fader is moved to -3dB in the Active Scene (i.e. up by 3dB), the fader position for the grouped Scene will become -3dB if **ABSOLUTE** mode is selected, or -17dB (-20dB + 3dB) if **RELATIVE**is selected.

The Group function can be globally disabled by touching the **Group** column title in the Automation Screen until it turns red. The column contents will also become greyed out, indicating that the column is inactive and no group changes will occur.

Note: The Master Tile Automation buttons are also available in the **Controls** Detail View in the **Scene View**.

Time Functions

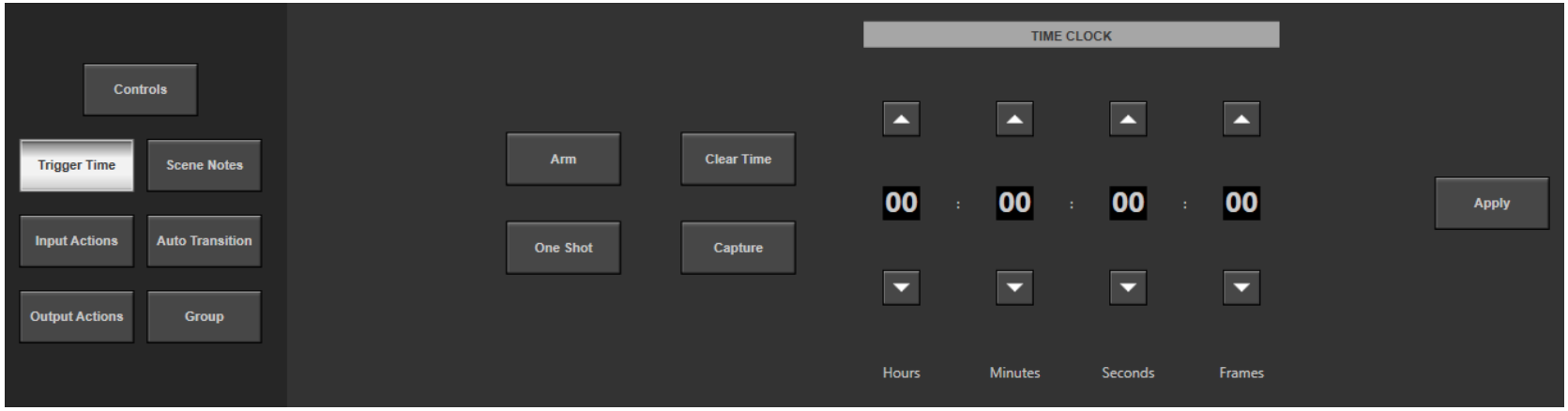
In addition to triggering Scenes manually from the Master Tile or Main Screen (as described in the Automation Overview), they can also be triggered using time functions.

Trigger Time

Scenes can be triggered automatically when the console's timecode reaches a specific value. *Note that additional hardware is required for this function. Contact a local SSL Salers or Systems Support representative for more information.*

To set a trigger time for a Scene:

Touch the timecode display in the Trigger Time column for the required Scene. The Trigger Time configuration page will open in the bottom half of the screen.



Insert the required timecode into the Time clock readout by touching each field's up and down arrows to increment and decrement them.
You can also clear the time to 0 by touching Clear Time, or insert the current timecode value by touching Capture.
Now touch Apply, and the timecode value will appear in the Scene's Trigger Time column.
Finally, the Trigger Time needs to be Armed by touching Arm. A green 'light' in the top left corner of the Scene's Trigger Time entry indicates that it is active.

If the One Shot button is activated, the Scene will be triggered next time its timecode is reached, but will then disarm to prevent further timecode triggering.

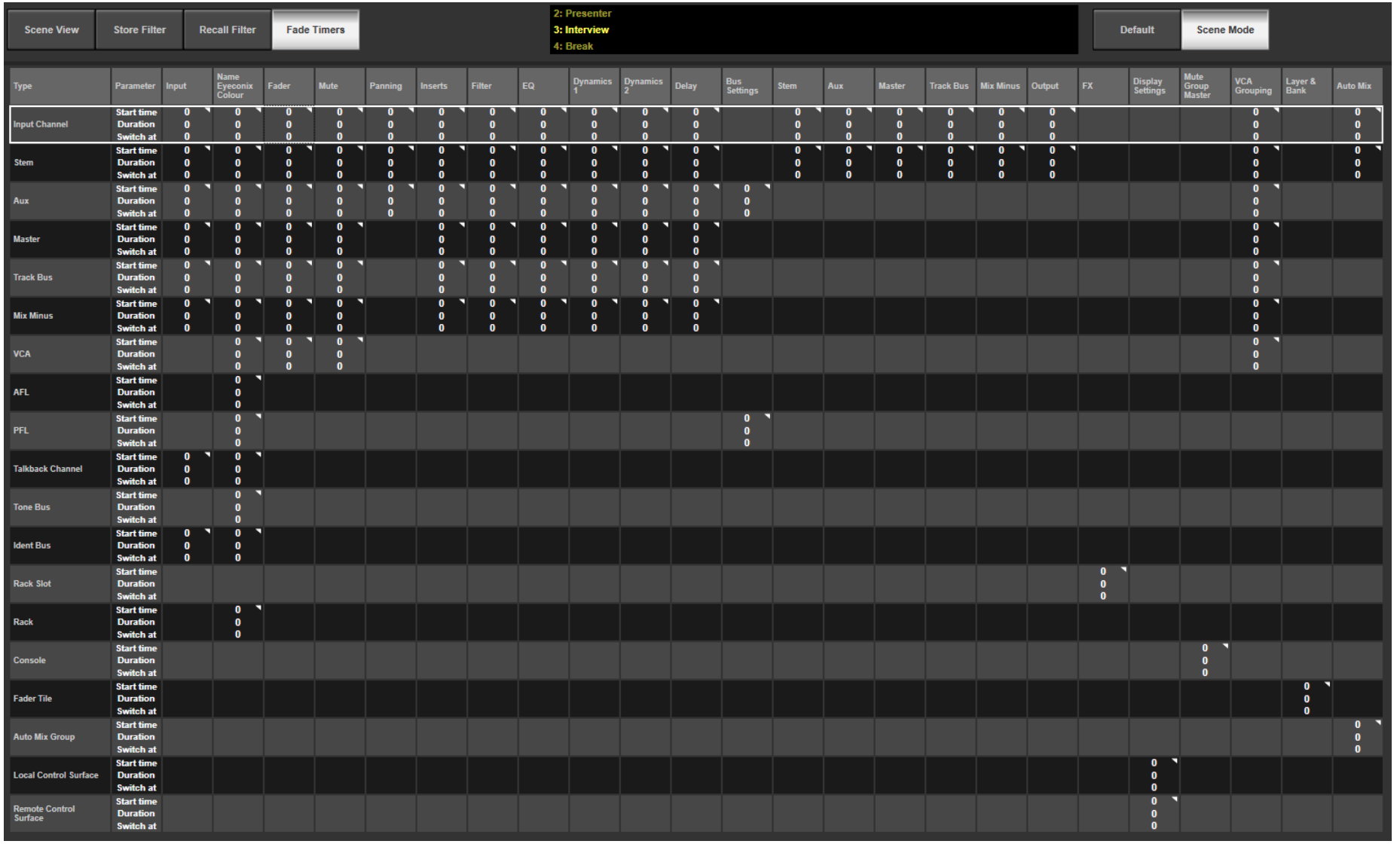
The Trigger Time function column can be globally disabled by touching the column title – it will go red and the column contents will become greyed out, indicating that the column is inactive. All Scenes with Trigger Times will now not be triggered when their timecode is reached.

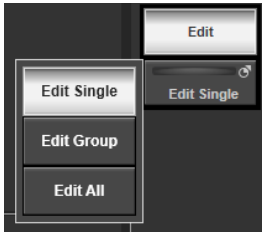
Fade Time

The Fade Time function displays how long the complete fade into the Scene will take. Because fades are defined for each element, this number is not editable.

To change the fade time for the elements of the Scene:

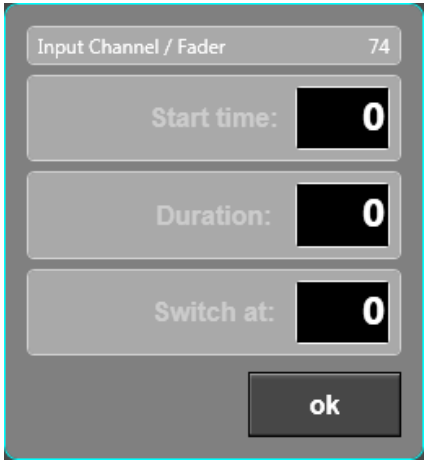
Select the Scene in **Scene View** then touch the **Fade Timers** button. A fade timers grid will appear, with Channel types listed as rows in the grid and individual channel elements listed as columns. (See next page).





To enter fade timers for individual scenes touch the **Scene Mode** button on the top right of the screen then enable the **Edit** button on the right of the screen.

Changes can be made to the Selected scene only, all scenes within the same Group (see Scene Groups) or all scenes by changing the edit range mode; Press & hold the button located just above the Edit button and choose Single Scene (default), Group Scenes or All Scenes. Subsequent Fade Time changes will now be applied to the defined range of scenes.



Tap in a crosspoint to open up a display of that element's timings; there are three times:
Start time: The length of pause before fade functions within that element start to fade;
Duration: The length of time the fade then takes;
Switch At: The length of pause before switch functions within that element are switched.

Double-tap a value to change it via the popup keyboard; press OK when finished.

The Scene's Fade Time will be the longest element fade (which is defined as the longest Start time + Duration combined, or Switch At).

Press **Scene View** to deactivate the display.

When the Scene is fired, a progress bar below its Fade Time display in the List indicates the proportion of the Fade time that has passed.

Times can be entered as NNN.NN upto a maximum of 999 seconds. *Note that the time entry is limited to three digits, so only N.NN, NN.N, or NNN are valid.*

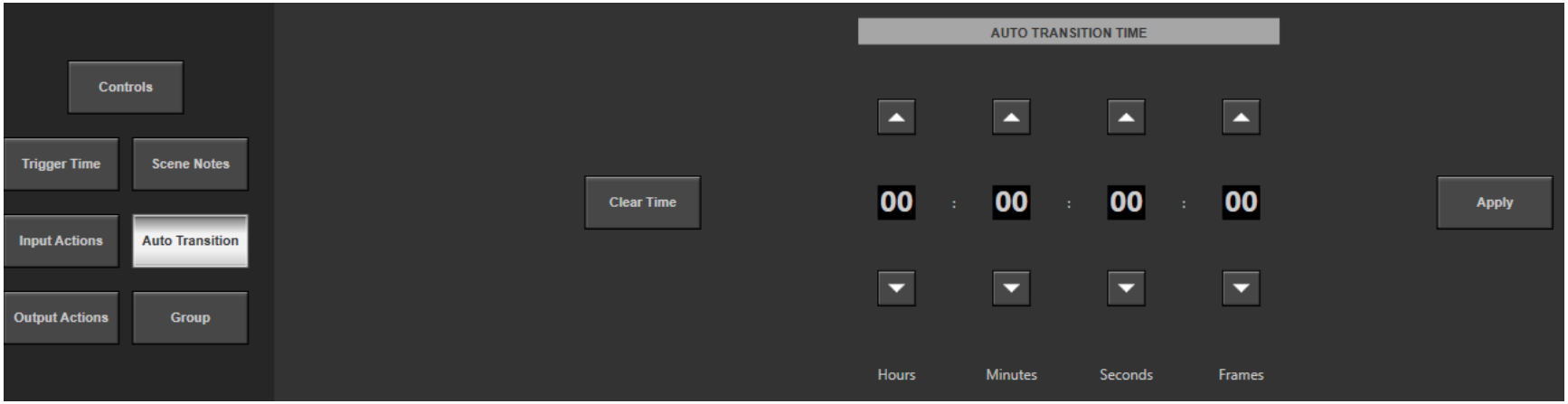
It is possible to set global defaults for scenes. To do this, touch the **Default** button in the top right of the screen and enter the defaults in the Fade Timers grid that appears.
Note: Default Fade Times are only applied to new Scenes; they do not affect fade timers for existing Scenes.

Transition Time

You can also define how long a Scene lasts, at the end of which the console will automatically move onto the next Scene in the display.

To set a Transition time for a Scene:

Touch the time display in the Transition column for the required Scene. The Auto Transition time configuration page will open in the bottom half of the screen.



Insert the required time into the Auto Transition time readout by touching each field's up and down the arrows to increment or decrement them. You can also clear the time to 0 by touching Clear Time.

Now touch Apply, and the time value will appear in the Scene's Transition column.

When that Scene is Active, a progress bar below its Transition time display in the List indicates the proportion of the Transition time that has passed. When the Transition time is reached, the next Scene in the List will automatically become active.

The Transition function column can be disabled by touching the column title – it will go red and the column contents will become greyed out, indicating that the column is inactive. Scenes with Transition times will now stay active until a different Scene is triggered by another method.

Skipping A Scene

If you want to prevent a Scene from being triggered as part of a sequence, touch its Skip box (at the left edge of the Scene List). It will go blue to indicate that the Scene will be skipped each time it is reached. This also 'hides' the scene when navigating through the scene list using the arrow buttons and prevents the scene from being fired by any Input Actions or Trigger Time. *Note: You can still trigger the scene manually by touching its GO box.*

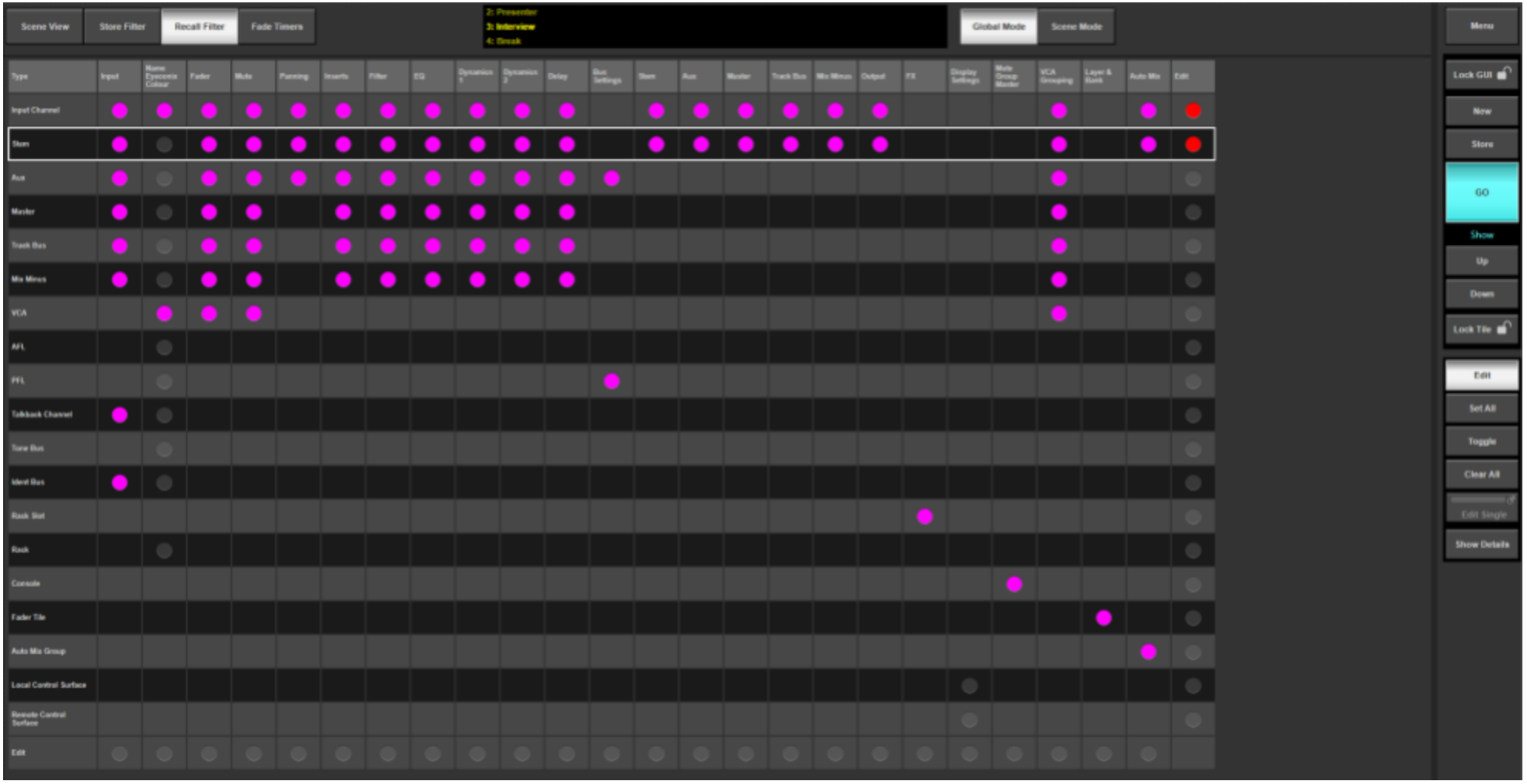
The Skip function column can be disabled by touching the column title – it will go red and the column contents will become greyed out, indicating that the column is inactive. Scenes with Skip selected will now be triggered when they are reached.

Scene Store and Recall Filters

Any functions within the console can be excluded when Scenes are stored and/or recalled. These function filters can be different for store and recall – if you want to store a setting but not recall it for now, you can filter it out in the Recall page, but leave it 'unfiltered' in the Store page. Filters can be programmed on a global basis, or Scene by Scene.

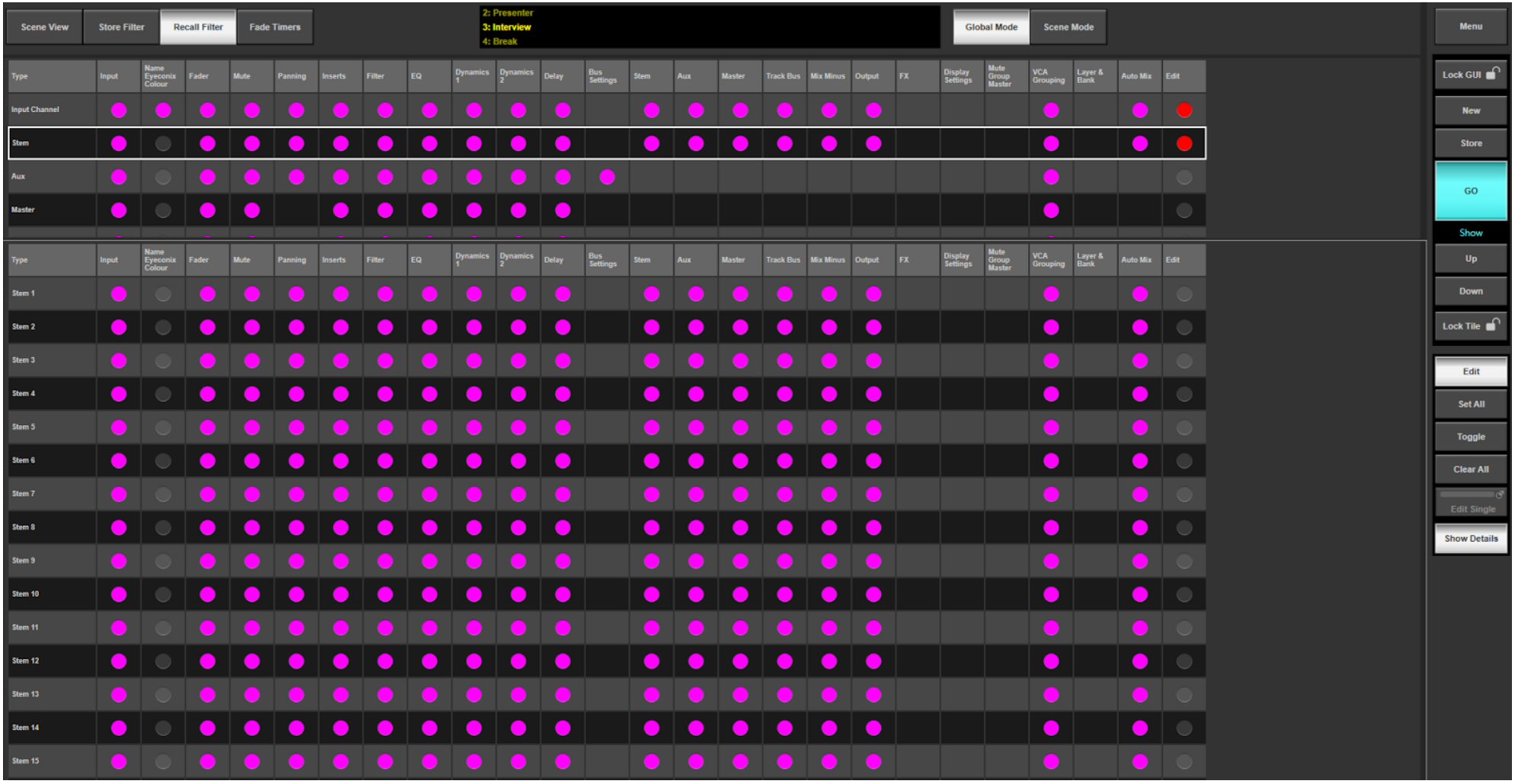
To access the Filters, touch the **Store Filter** or **Recall Filter** button in the top left of the Automation screen. Then select either the **Global Mode** or the **Scene Mode** button on the top right of the screen.

A filter grid will appear:



Note: The colour of the screen's indicators are purple for Recall Filters (as above) and blue for Store Filters.
Elements must be set to store or recall in both the Global and per-scene Filter pages for that parameter to be stored/recalled. Edit mode must first be enabled to make any changes to the filters (see below).

Channel types are listed as rows in the grid, while individual channel elements are listed as columns.
Each 'channel type' row can be expanded to display each individual channel of that type, by touching the **Show Details** button at the bottom of the right hand side button column.



Each coloured indicator represents a specific channel element in a specific channel type or channel number. Grid cells that are grey indicate that a particular element doesn't exist or is disabled for that channel element type.

The indicators appear 'lit' when they are included in that store or recall function, and appear 'unlit' if they are filtered out (excluded from store or recall).

Store Filters

Global Mode: Global store enabled*. **Scene Mode**: Store enabled in both Global and Scene Filters

Store disabled

(Scene Mode only) Store enabled in Scene but not in Global

Store enabled for some items (use Detail View to expand grid)

(Scene Mode vonly) Store enabled for some items in both Global and Scene Filters

Recall Filters

Global Mode: Global recall enabled*. Scene Filter: Recall enabled in both Global and Scene Filters

Recall disabled

(Scene Mode only) Recall enabled in Scene but not in Global

Recall enabled for some items (use View buttons to expand grid)

(Scene Mode only) Recall enabled for some items in both Global and Scene Filters

*Data must be set to store/recall in both Global and per-scene Filter pages, so this state does not necessarily mean the data will be stored/recall; the per-scene Filter must also be enabled.

Important Note: Adjusting filters can result in loss of data so great care should be taken when using them.If a parameter does not have a stored value (i.e. if it has been filtered out in the Store Filters page), but it has been set to recall in the Recall Filters page, then the default setting for that parameter will be recalled.

Tip: Unless different filters are required per scene, enable store & recall for all elements in all per-scene Filter pages and use the Global Filter pages to define the store/recall scope.

You can change the filter settings by enabling the Edit function; Touch the Edit button on the right side of the screen to enable.

Changes can be made to the Selected scene only, all scenes within the same Group (see Scene Groups) or all scenes by changing the edit range mode; Press & hold the button located just above the **Show Details** button and choose Single Scene (default), Group Scenes or All Scenes. Subsequent Filter changes will now be applied to the defined range of scenes.

Touch an individual indicator in the grid to toggle its state.
It is also possible to change entire rows and columns using the round Edit indicators at the end of each row and column:
Touch any Edit indicator to select it – it will go red to indicate that its row or column is being edited.
Multiple rows and columns can be selected. You can also select the complete set of rows and columns by touching the Edit label itself.

The three edit functions listed below the **Edit** button will now be available:
Touch the **Set All** to include all selected indicators in the store or recall.
Touch **Toggle** to invert the states of all selected indicators.
Touch **Reset All** to exclude all selected indicators from the store or recall.
Touch **Edit** again to disable the Edit function, and touch the **Scene** button to close the filter page and return to Scene List view.

Note: The Edit functions above will be applied to all rows with their red Edit indicator set, even ones above or below the currently visible set of channel types.

Simple And Accumulative Recall Modes

Scenes that have recall filters applied to them can be recalled in two different ways.

'**Simple**' recall mode treats each scene independently and disregards the recall filters and settings from any scenes before or after it in the list. Recalling a scene in this mode will recall only the settings set to recall in that scene.

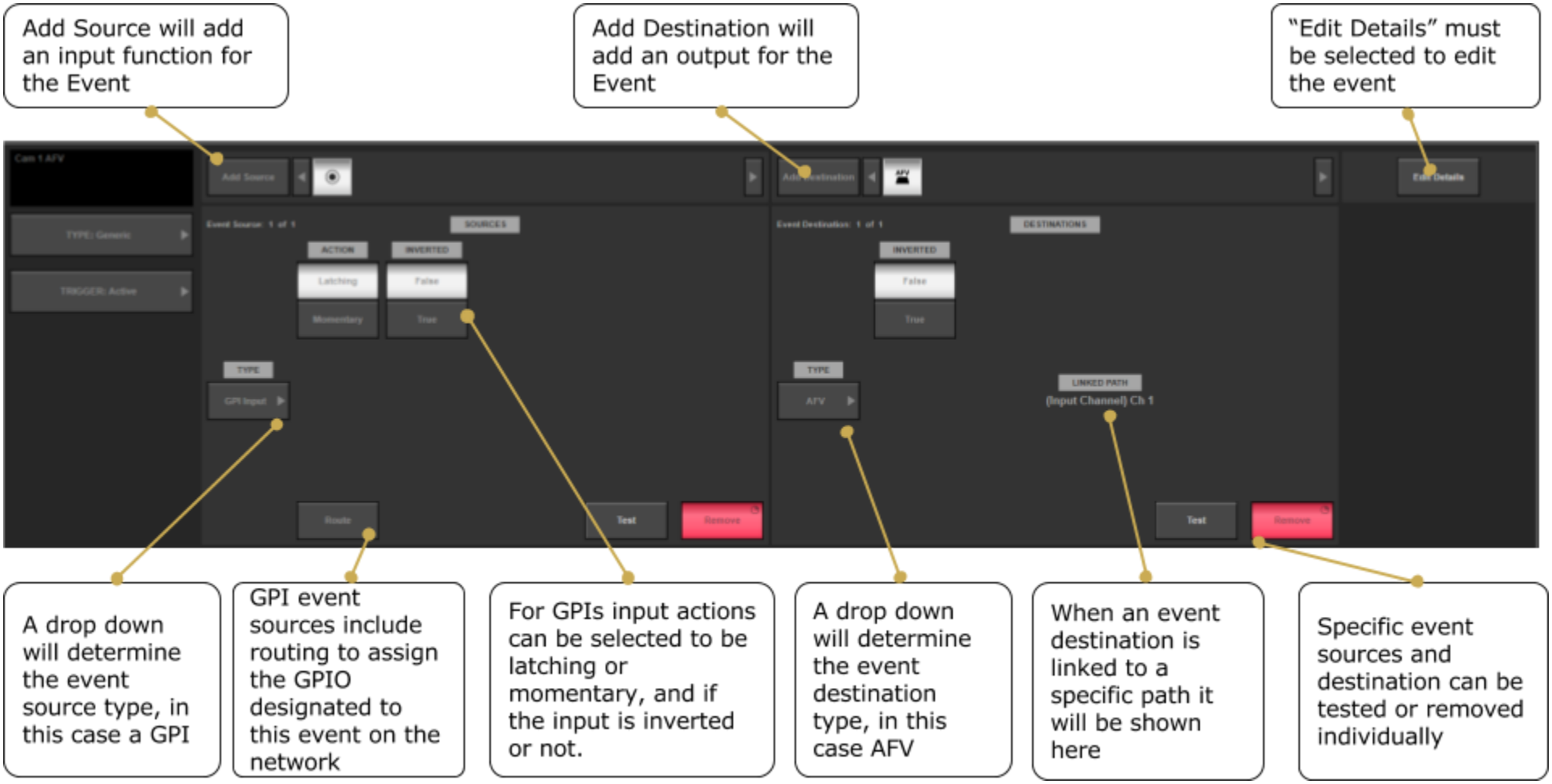
'**Accumulative**' recall mode accumulates any changes that have been made between scenes even if recalling them out of order, as if each scene between the previous and next scene have been fired in sequence, so that if a setting is set to be recalled in an intermediate scene but not the Active Scene, its value will be recalled even though the Active Scene's recall filter is off for that setting.

Accumulative Recall Example: The guitarist changes guitar in scene 5 for use in the rest of the show, so a different EQ setting is recalled in scene 5 only (EQ not recalled in any other scene). If jumping from scene 4 to scene 6, the new EQ setting is applied, even though scene 5 has not been fired and the EQ setting is not set to recall in scene 6.

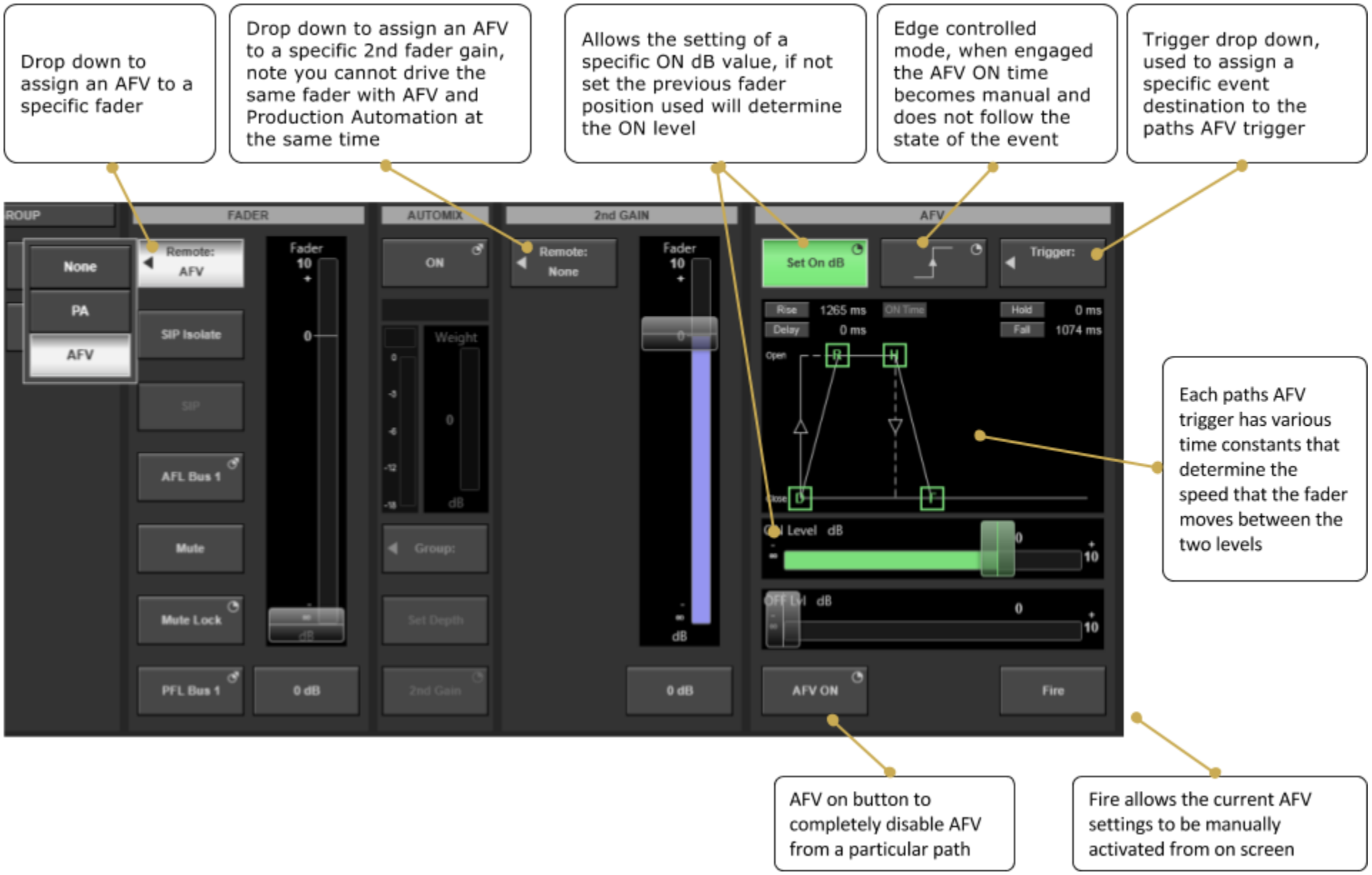
To switch between Simple and Accumulative modes, use the Controls buttons on the right side of the Scene Detail **Control** view.

Audio Follow Video (AFV)

System T has a comprehensive Audio Follow Video System that allows external equipment to trigger the opening and closing of any path faders using GPI inputs. This provides an automatic mix capability for events where audio sources need to track camera changes quickly, for example the drive-by mics on a motorsport racetrack.


Add Source will add an input function for the Event
Add Destination will add an output for the Event
"Edit Details" must be selected to edit the event
A drop down will determine the event source type, in this case a GPI
GPI event sources include routing to assign the GPIO designated to this event on the network
For GPIs input actions can be selected to be latching or momentary, and if the input is inverted or not.
A drop down will determine the event destination type, in this case AFV
When an event destination is linked to a specific path it will be shown here
Specific event sources and destination can be tested or removed individually

Audio Follow Video triggers are available as destinations in the **Setup, Events Manager** page**.** Typically a AFV event will be configured for each GPI that is being used for AFV, the Events are stored in the showfile so should be included in any showfile templates where appropriate.

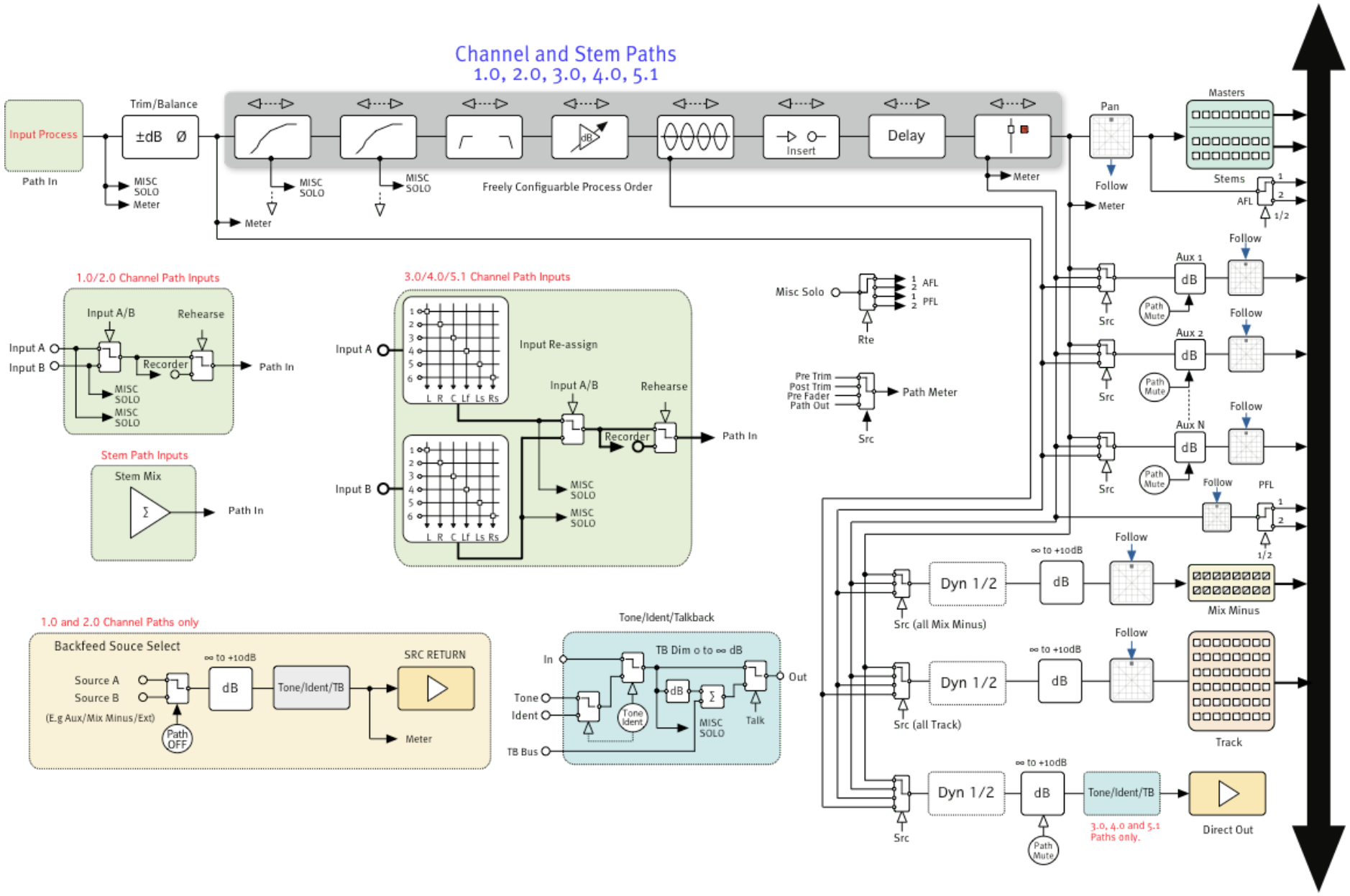

Drop down to assign an AFV to a specific fader
Drop down to assign an AFV to a specific 2nd fader gain, note you cannot drive the same fader with AFV and Production Automation at the same time
Allows the setting of a specific ON dB value, if not set the previous fader position used will determine the ON level
Edge controlled mode, when engaged the AFV ON time becomes manual and does not follow the state of the event
Trigger drop down, used to assign a specific event destination to the paths AFV trigger
Each paths AFV trigger has various time constants that determine the speed that the fader moves between the two levels
AFV on button to completely disable AFV from a particular path
Fire allows the current AFV settings to be manually activated from on screen
FADER
AUTOMIX
2nd GAIN
AFV
None
PA
AFV
Remote: AFV
SIP Isolate
AFL Bus 1
Mute
Mute Lock
PFL Bus 1
Fader
ON
Weight
Group:
Set Depth
Remote: None
Set On dB
Trigger:
Rise 1265 ms
Delay 0 ms
Hold 0 ms
Fall 1074 ms
0 dB
AFV ON
Fire

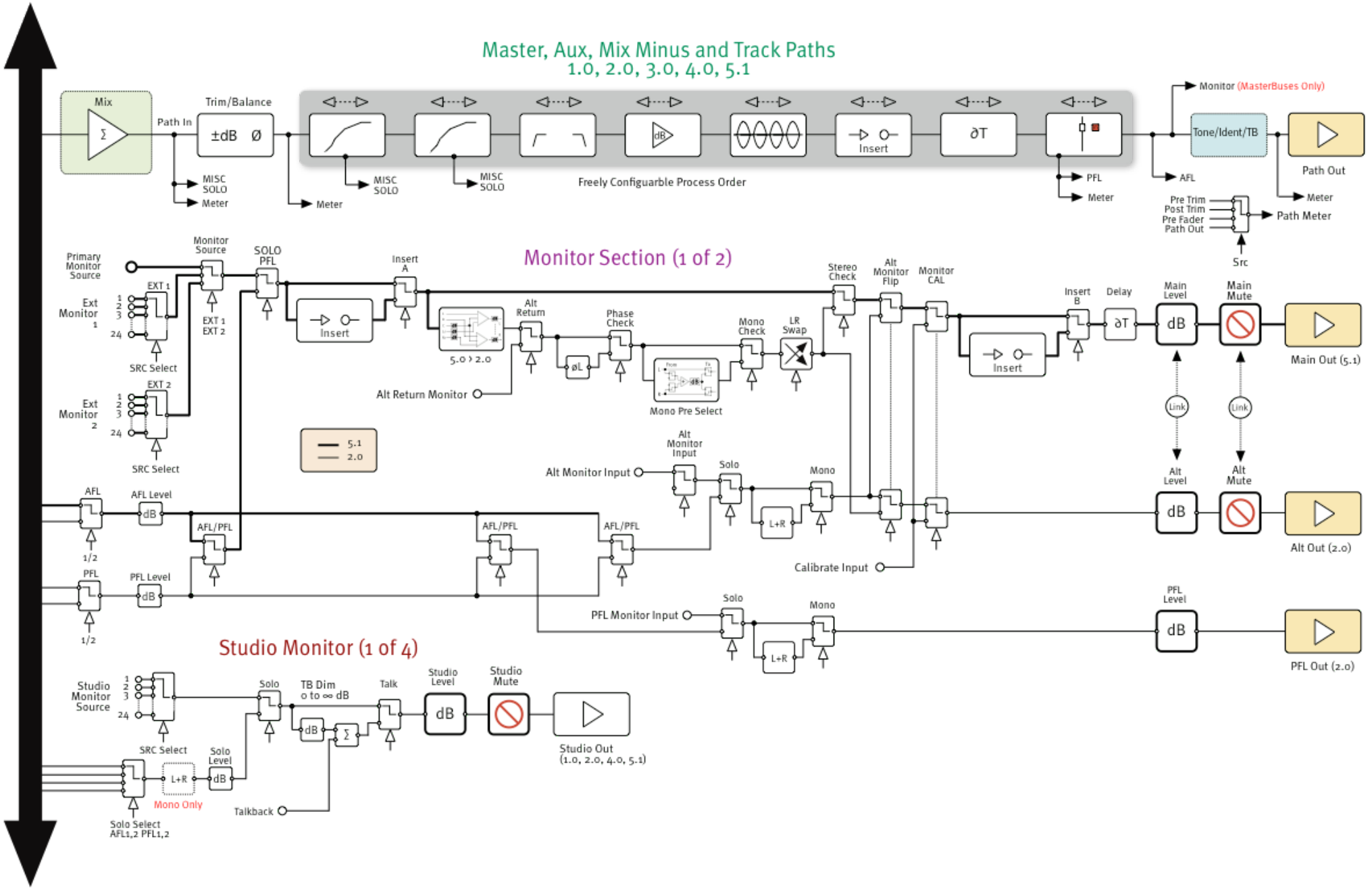
Delay (D) sets the time before the ON Ramp starts once the activation signal is received. Rise (R) is the time taken for the gain to fade from the OFF Value (default is OFF ∞db) to the ON Value. Hold (H) is the time that the gain remains at the ON level after the activation signal is removed. Fall (F) is the time taken for the gain to return from the ON level back to the OFF level. When edge controlled mode is enabled ON Time (ON) is sets the faders ON duration. All ramp delay and fade times are can be set between 0 and 5000ms.

Production automation suspend on touch

For consoles driven by production automation, if the production automation does not read back the console's fader position when it is moved manually, a conflict of the current fader position can occur. While a fader is being touched it is temporarily suspended from being under control of the automation system. When touch is removed the next position sent by the production automation system will be observed.

Channel/Stem path overview diagrams




Master, Aux, Mix Minus and Track Paths
1.0, 2.0, 3.0, 4.0, 5.1
Mix
Path In
Trim/Balance
±dB Ø
MISC SOLO
Meter
Freely Configuarble Process Order
Insert
∂T
PFL
AFL
Monitor (MasterBuses Only)
Tone/Ident/TB
Path Out
Pre Trim
Post Trim
Pre Fader
Path Out
Path Meter
Src
Monitor Section (1 of 2)
Primary Monitor Source
Ext Monitor 1
Ext Monitor 2
EXT 1
EXT 2
SRC Select
Monitor Source
SOLO PFL
Insert A
5.0 > 2.0
Alt Return
Alt Return Monitor
Phase Check
Mono Pre Select
Mono Check
LR Swap
Stereo Check
Alt Monitor Flip
Monitor CAL
Insert B
Delay
Main Level
Main Mute
Main Out (5.1)
Link
Alt Level
Alt Mute
Alt Out (2.0)
5.1
2.0
Alt Monitor Input
Solo
Mono
L+R
Calibrate Input
AFL
AFL Level
PFL
PFL Level
AFL/PFL
1/2
PFL Monitor Input
PFL Out (2.0)
Studio Monitor (1 of 4)
Studio Monitor Source
SRC Select
Solo Level
Mono Only
Solo Select AFL1,2 PFL1,2
TB Dim o to ∞ dB
Talk
Studio Level
Studio Mute
Talkback
Studio Out (1.0, 2.0, 4.0, 5.1)

Routing

THIS SECTION IS STILL TO BE COMPLETED

NOTE: Shutdown removes consoles Dante routing

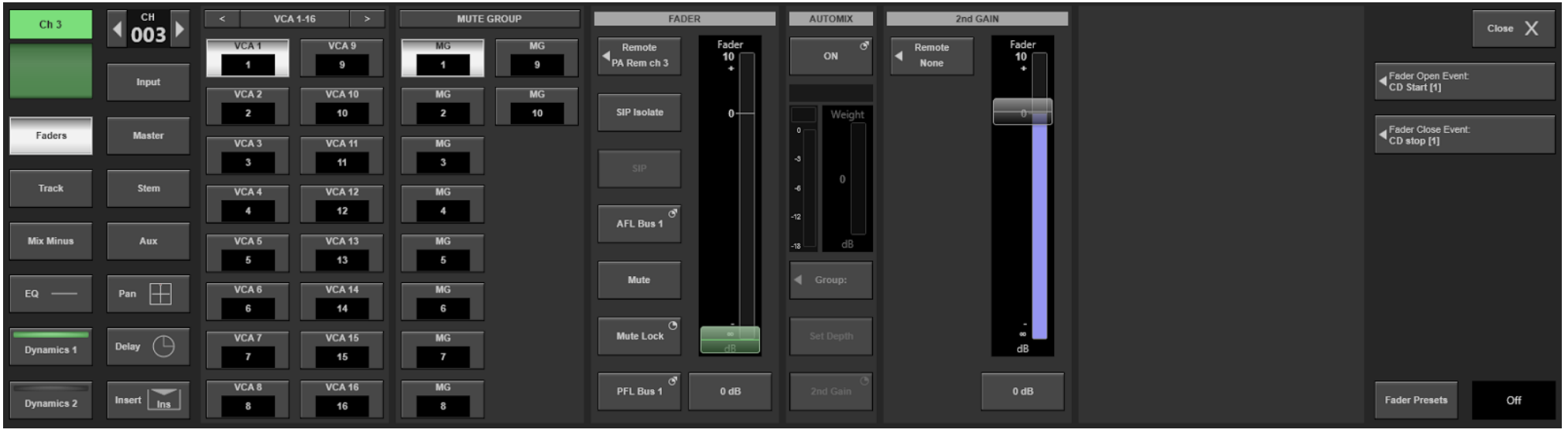
Dante Routing across the network is "owned" by the console that made the route, when a console is shutdown the Dante routes are now removed from the network (in the same way that loading a blank showfile would do). This frees up audio resources and ensures correct routes can be established across larger multiple console System T Dante networks.

Events Manager

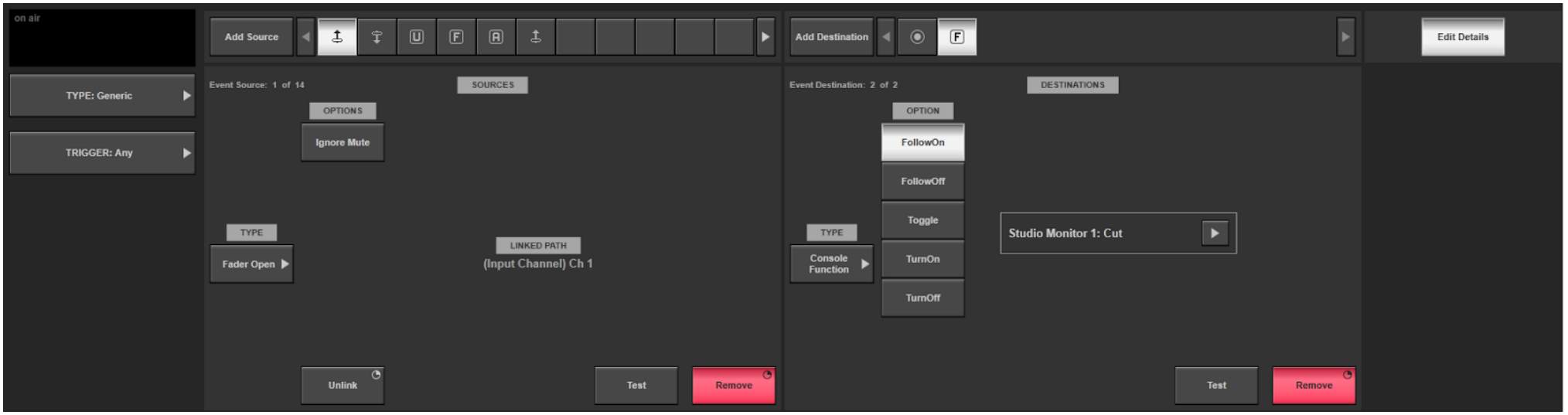
Fader Starts & Fader State Driven Events

The Events system allows programming of state driven actions on the console or GPIO system. You can trigger these events from the "fader open" and "fader closed" state of any path. Within each source of the event you can chose to ignore the mute state of that path, with ignore mute turned off the fader is seen as closed by the event when the path is muted. When building the event it is useful to give the event a name, then the event can easily be selected on a specific path when required.

Any Events that have fader open or fader closed assigned are automatically added to the appropriate fader state events list. In the Fader Detail view on the "channel view" screen you can assign these events to paths.



Events manager capabilities include AFV as destinations , additional console functions including all the monitor source selectors, plus the ability to have more than 12 event sources and destinations.



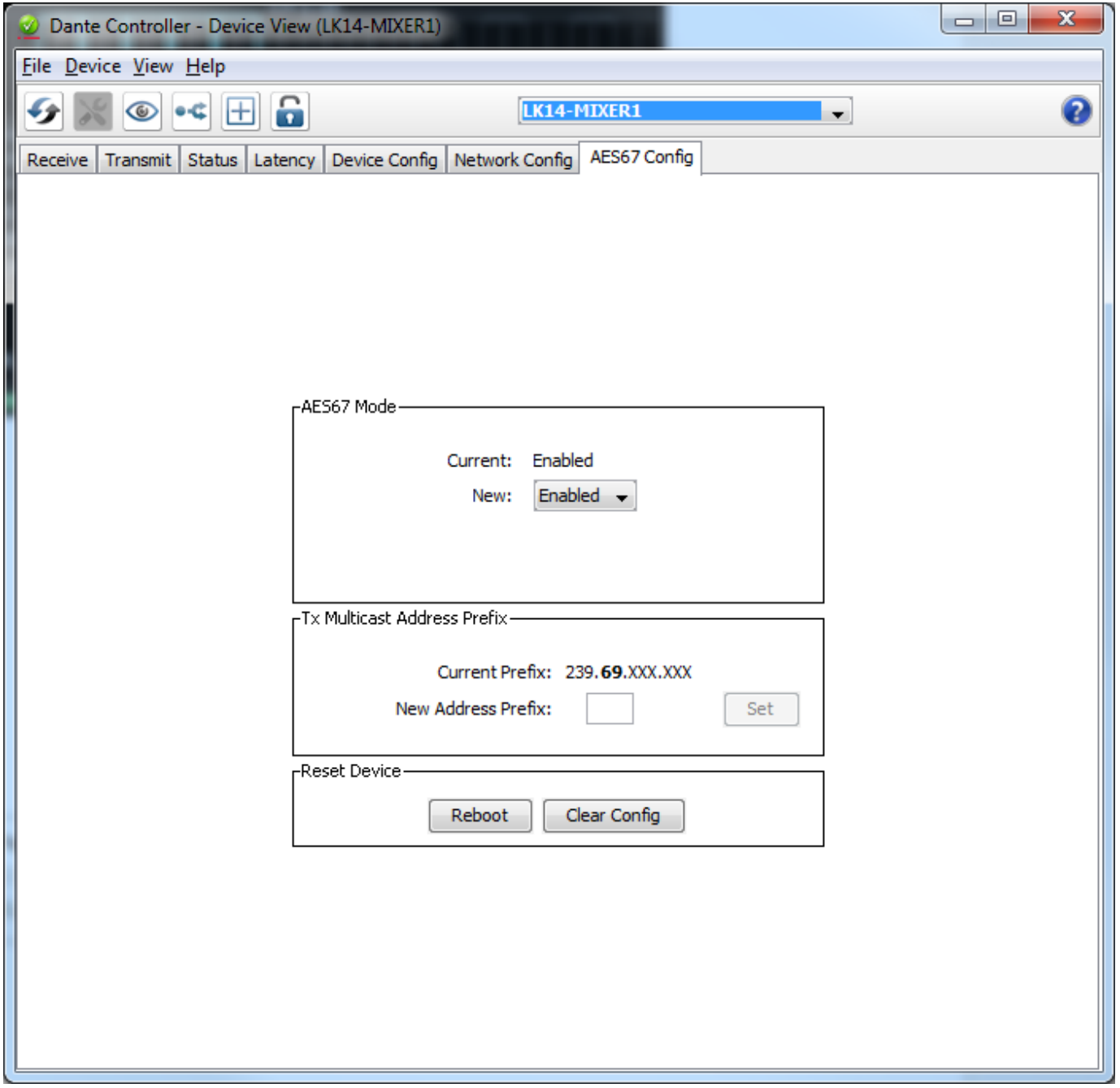
AES67 support on Dante HC card

All SSL Network IO units support AES67 audio.

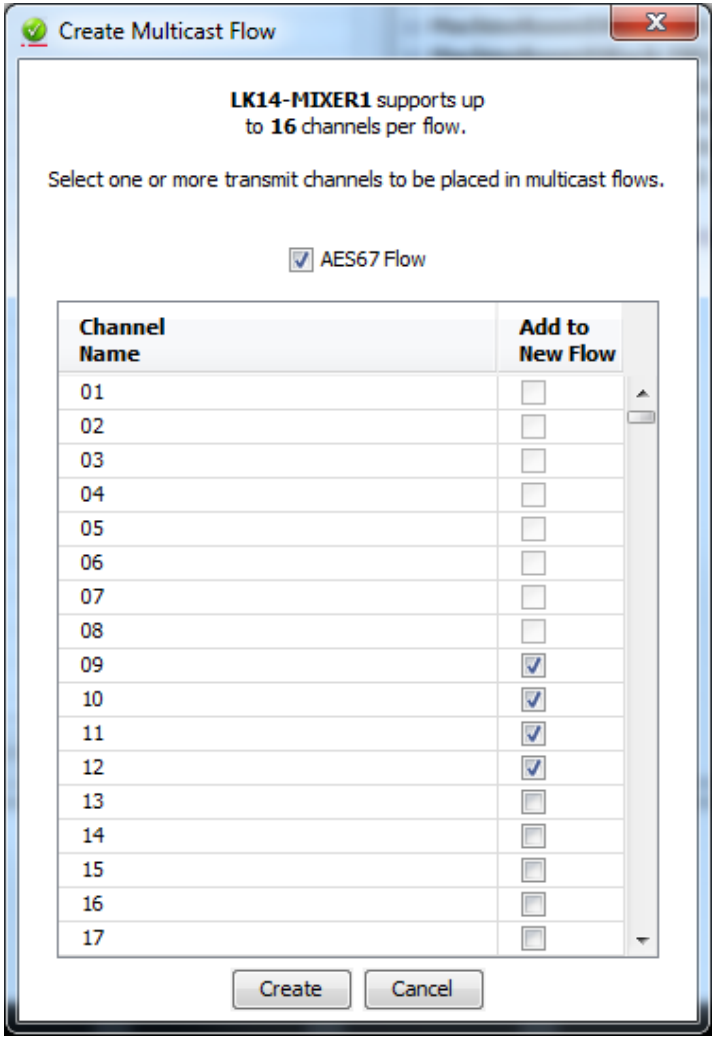
AES67 Multicast Tx flows from specific channels are configured using Dante controller.

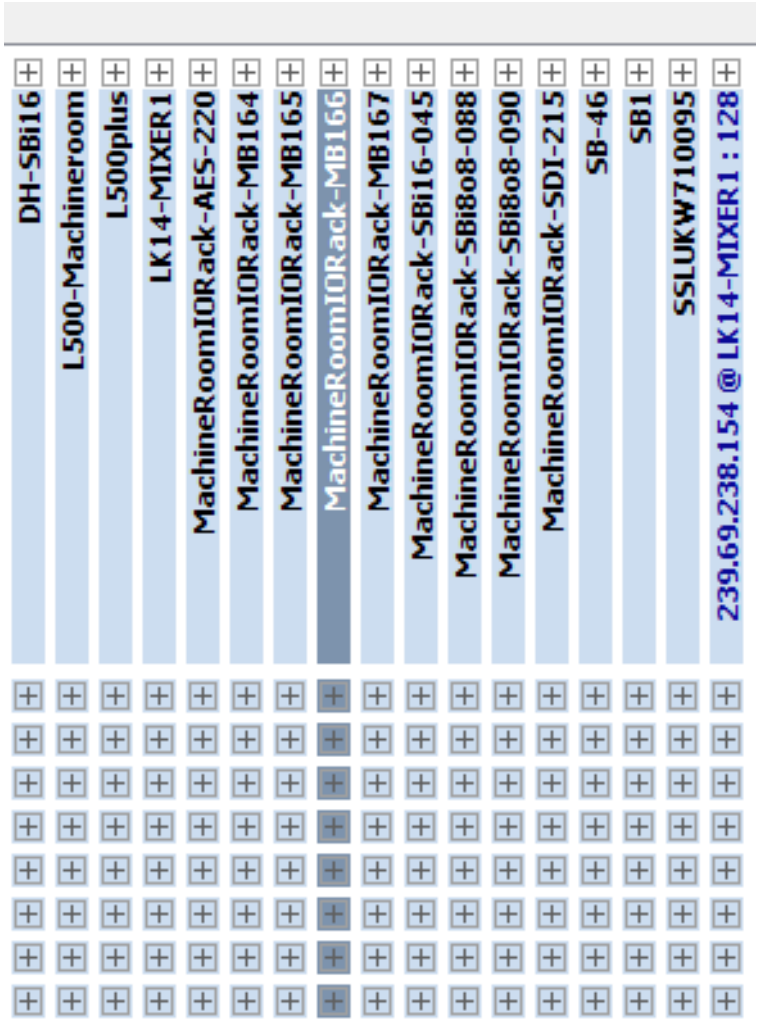
Details can be found in the Audinate Dante Controller Manual.

When setting up AES67 connections to and from System T via the Dante HC Cards, "Virtual Tie Lines" should be used in the console routing GUI. This will allow the console routing GUI to make the routes to and from the point the signal gets to the network, allowing the AES67 Rx connections to be managed in Dante controller. AES67 Tx flows defined in Dante controller will need connecting to other devices in that other devices software.

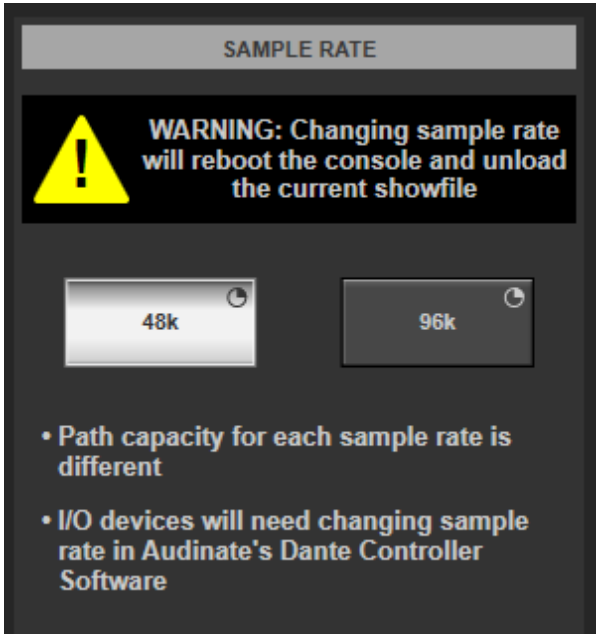


It is important to understand that AES67 provides a means to exchange audio transport and clocking between different AoIP technologies, it does not replace these technologies. AES67 does not define complete discovery or connection management. For System T, Dante provides a complete audio routing solution that replaces expensive TDM routers with AoIP. AES67 can provide AoIP tie lines into other systems that do not include Dante.





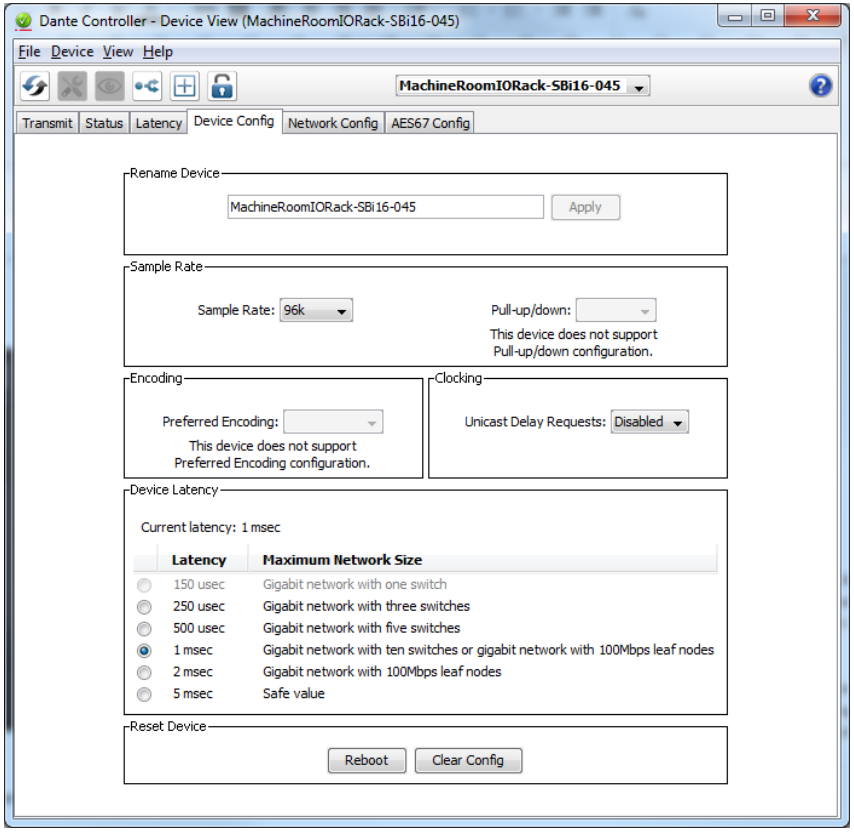
96kHz Operation


SAMPLE RATE
WARNING: Changing sample rate will reboot the console and unload the current showfile
48k
96k
• Path capacity for each sample rate is different
• I/O devices will need changing sample rate in Audinate's Dante Controller Software

System T can operate at 48kHz or 96kHz sample rates, the processing resources are different at each sample rate. The current sample rate of the console is shown in the status bar on the main console screen

Sample Rate	48kHz	96kHz
All Paths	800	500
Bus Paths	192	120
Stem paths	80	48

Showfiles are sample rate dependant and will not load if the console is set at a different sample rate. An error message with be shown in the status bar. If both sample rates are to be used, showfile templates that cover the connections of the standard audio routing and prefered configurations should be configured in the templates folder. The 'Notes' feature in showfile management is a useful place to keep track of shows sample rate.


Dante Controller - Device View (MachineRoomIORack-SBi16-045)
File Device View Help
MachineRoomIORack-SBi16-045
Transmit Status Latency Device Config Network Config AES67 Config
Rename Device
MachineRoomIORack-SBi16-045
Apply
Sample Rate
Sample Rate: 96k
Pull-up/down:
This device does not support Pull-up/down configuration.
Encoding
Preferred Encoding:
This device does not support Preferred Encoding configuration.
Clocking
Unicast Delay Requests: Disabled
Device Latency
Current latency: 1 msec
Latency
Maximum Network Size
150 usec Gigabit network with one switch
250 usec Gigabit network with three switches
500 usec Gigabit network with five switches
1 msec Gigabit network with ten switches or gigabit network with 100Mbps leaf nodes
2 msec Gigabit network with 100Mbps leaf nodes
5 msec Safe value
Reset Device
Reboot
Clear Config

IO devices of different sample rates can be present on a Dante network, but only devices of the same sample rate will be able to successfully make routing connections between them. Before changing the consoles sample rate Network IO devices including the Dante HC cards related to the Tempest Processing Engine need to be changed to the new sample rate using Dante controller. The Sample rate settings can be found in the **Device View** window, **Device Config** Tab. If a Dante IO device that is already connected to the console needs to have its sample rate changing, the console will then need a reboot to show the device as fully online.

Note: The System T routing GUI is not aware of device sample rate and cannot currently show when routing has not been successful due to a mismatch of sample rate. If using multiple sample rates it is advisable to have Dante controller available for diagnostics.

Solid State Logic

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System T

V1.8 Feature Release Notes

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PLEASE READ ALL INSTRUCTIONS, PAY SPECIAL HEED TO SAFETY WARNINGS.

E&OE

Document Revision History

FIRST DRAFT	Tom Knowles		30th November 2017
INITIAL RELEASE	Tom Knowles		6th December 2017
2nd RELEASE	Tom Knowles	Fixed Typos.	12th December 2017

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- Names
- Logical Devices from Virtual Tie Lines

Introduction

This document covers the features of System T V1.8 control software release. Some features covered in this document were available in the V1.6 and V1.7 release, they are covered here for completeness. Update instructions for V1.8 are provided in a separate document.

S300 Support

This release supports an additional System T control surface option, the S300. S300 comes in 2 versions: 16+1 faders and 32+1 faders[1]. S300 can connect to either a T25 (256ch@48kHz) or a T80 (800ch@48kHz) and runs the exact same software as the larger S500 surface and rack-mounted TCR. Complete showfile compatibility between all System T consoles and controllers means production can easily move between control rooms within a facility, or an S300 can very easily be used as a backup surface to a larger S500. Where processing engines are of different sizes, SSL's unique compatibility mode allows the pre-selection of channel, busses and effects resources that will be inactive on the smaller processing engine. Settings from the larger device are never lost and resources can be reassigned at any point during the show, even with audio passing.

Installation information specific to the original S500, the new S300 and the TCR can be found in the updated System T Installation Guide. As the software is identical between the control devices there are some new features to support the S300 surface. These are available on all control models to enable full showfile compatibility across the System T range.

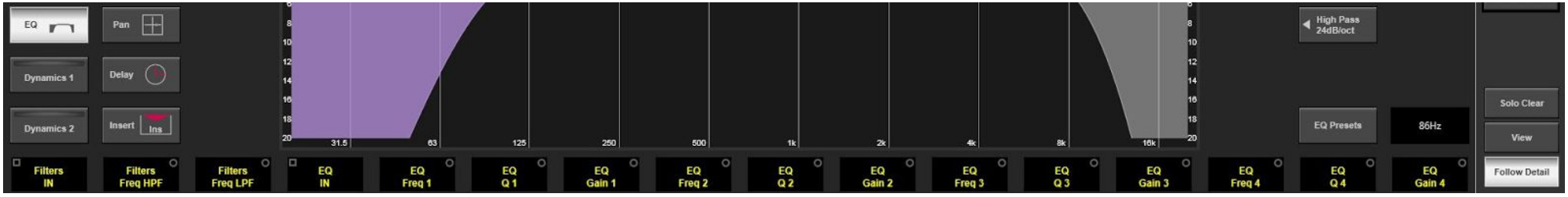
[1] 32+1 fader version available April 2018 and is not supported in V1.8

Detail View Encoder Display - “Show Path Name”

With the channel detail view open, there is an option to also show the channel name in the area where the quick encoder information is shown. This splits the display into 2 sections with the channel name and colour shown in the lower half and the current quick encoder function described in the top half. This feature is primarily intended for use with the new S300 control surface.

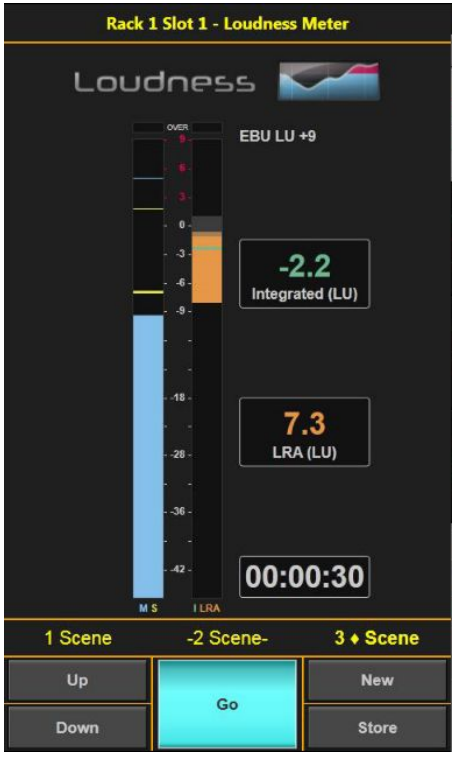
The option can be enabled or disabled in **Setup, Options, Surface**.

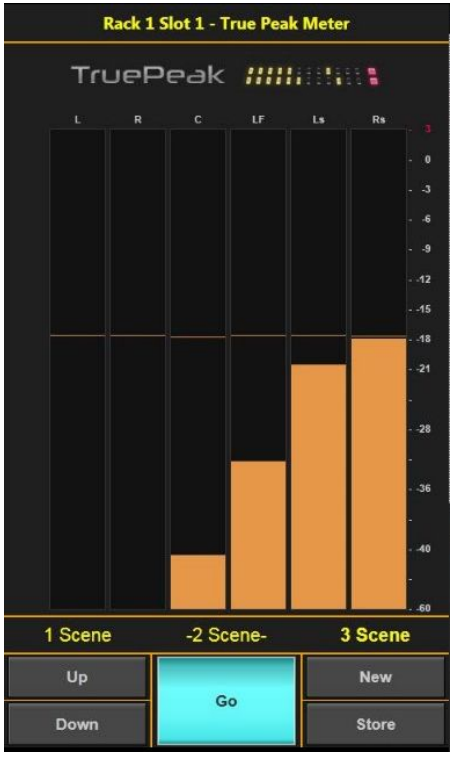
With **Show Path Name** turned off the area below the channel detail view will show the parameters currently being controlled by the quick encoders as in V1.7 and earlier software versions

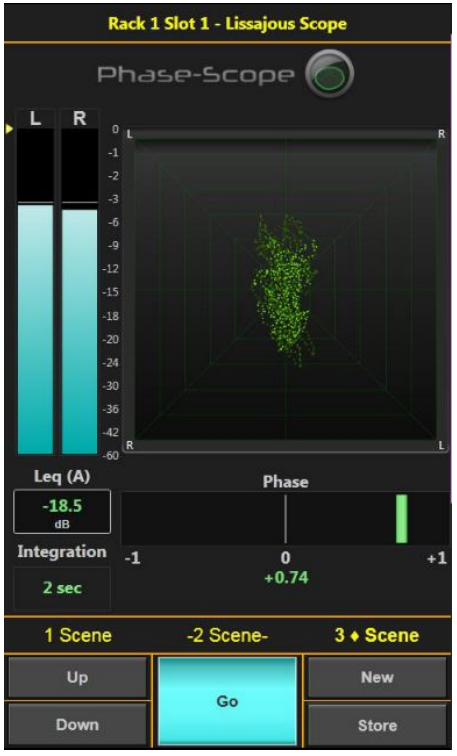


S300 FX Rack Meter Viewer

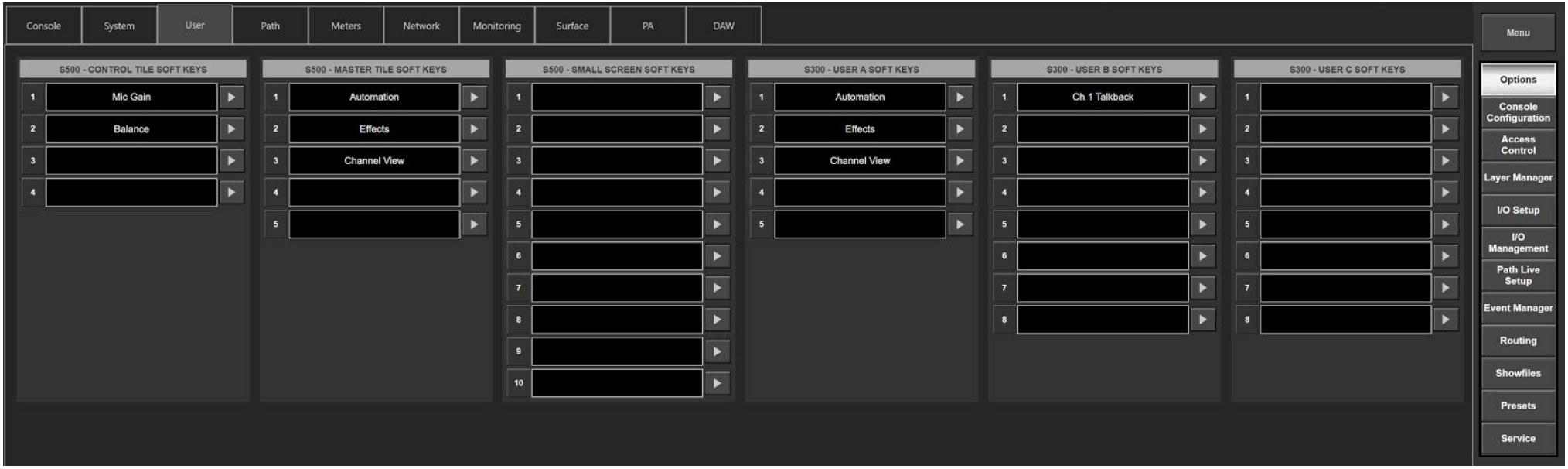
S300 includes a master section with a screen for metering, this screen would typically be used for metering the main output. For this release the meter is taken from rack 1, slot 1 of the FX Rack. This provides the option to display Loudness or True Peak metering for all formats up to 5.1, or a Phase-scope currently available for Stereo and LCR formats.







User Key Assignment

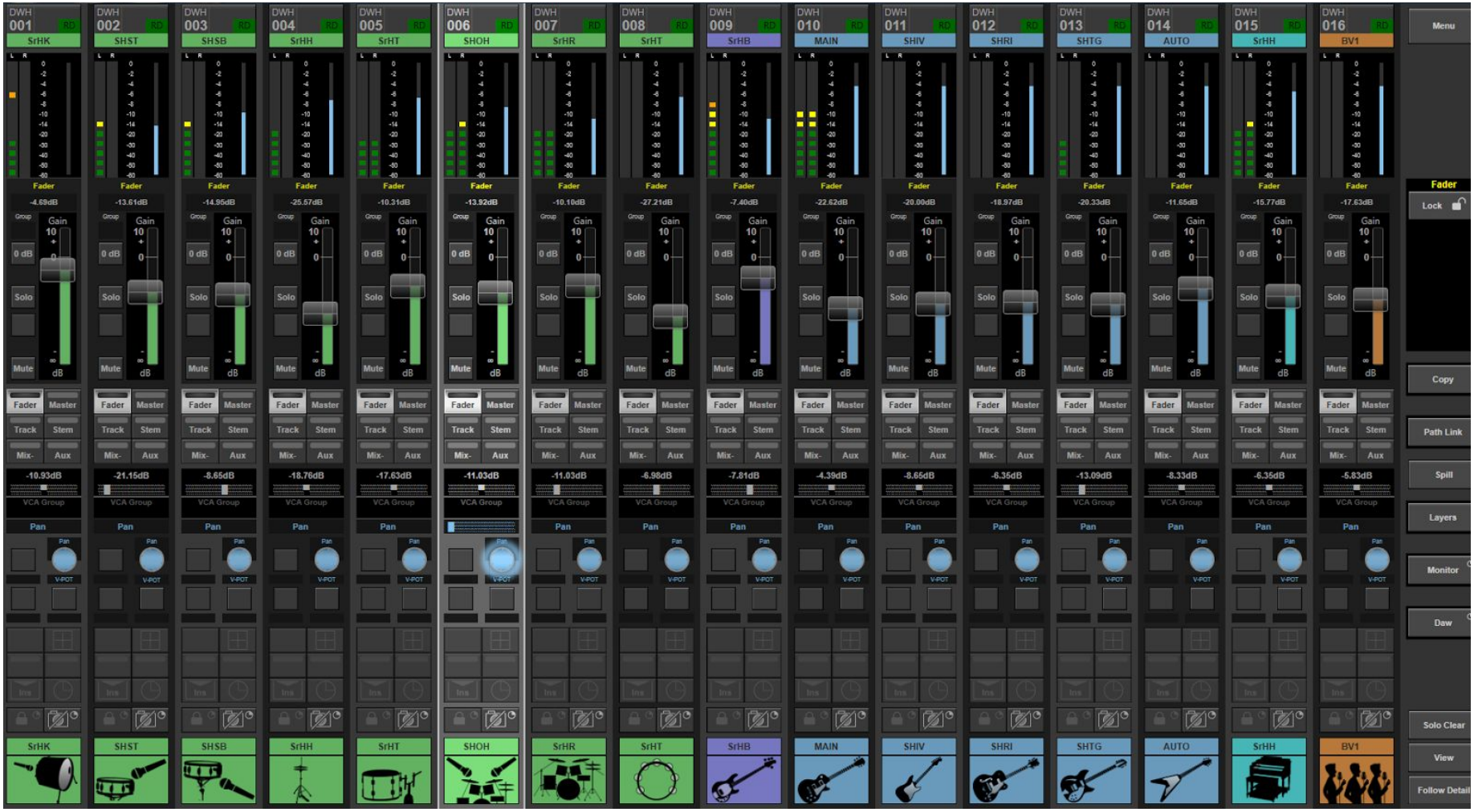


The master sections of the S300 and S500 have a different layout of user keys. The software allows you to configure the user keys for both target surfaces while working on either console. This allows functions to be placed in the same showfile for both surfaces, so they are immediately available when transferring showfiles between each surface variant. The S500 keys are shown in the 3 left hand columns while the S300 keys are shown in the 3 columns on the right.

DAW Control

System T now supports DAW control via the HUI™ protocol. This is primarily for integrating with Pro Tools but is a control option with some other DAW software. 8, 16, 24 or 32 DAW controller channels can be configured for up to 4 separate DAWs. Connection is via the Studio Integration Network port using ipMIDI as on other SSL DAW control products.

Instructions for installing ipMIDI and configuring the network connection for DAW control can be found in the V1.8 Install instructions.



DAW Control Basics

The HUI protocol was originally developed to control Pro Tools from dedicated control surfaces built by Mackie. All DAW functions described in the following pages refer specifically to Pro Tools operation and use the label names of the hardware control functions that the System T DAW control software emulates.

There are other DAWs that can be controlled via the HUI protocol, however most of them do not map the HUI control messages directly to equivalent functions. Solid State Logic has extensively tested our HUI implementation with Pro Tools on both Mac and PC platforms but unfortunately is not able to offer support for DAWs other than Pro Tools when using System T's DAW control in the event that issues arise in their use of the HUI protocol.

DAW control can be configured in banks of 8 consecutive channels with a maximum of four banks providing 32 physical console faders for DAW Control for each DAW. As there are both channel scrolling and banking keys there is no limit to the number of tracks in a Pro Tools session that can be accessed, as the tracks can be scrolled or banked on to the console faders as required. Pro Tools Memory Locations can also be used to recall specific track layouts. When using System T as the primary control surface for a Pro Tools mix session, configuring two physical bays as a 32 fader surface (four HUI ports) and banking in 32 track increments is typically the most favourable solution. When Pro Tools is being used as playback source together with other live audio sources, a two HUI port setup may well be the optimal solution by configuring a dedicated 16 Fader DAW control bay with the other console bays able to handle standard input and output channel paths.

DAW control is via the System T fader tiles with the controls mapped to the DAW mixer functions instead of the System T processing. The faders control DAW track level and the encoders control track panning and send levels. A Flip function allows the faders to control send levels. Track arming and automation modes can be set via the Q switch.

A new DAW pop-out in the Channel View screen contains groups of buttons to assign the encoder function and set up track automation modes. It also offers transport control, plus channel scrolling and banking buttons and other useful master functions. These are explained in detail in the following pages. All of these functions - together with additional commands available in the HUI protocol - can be mapped to User Keys as well as incorporated into Event Manager programming.

Main Controller Features

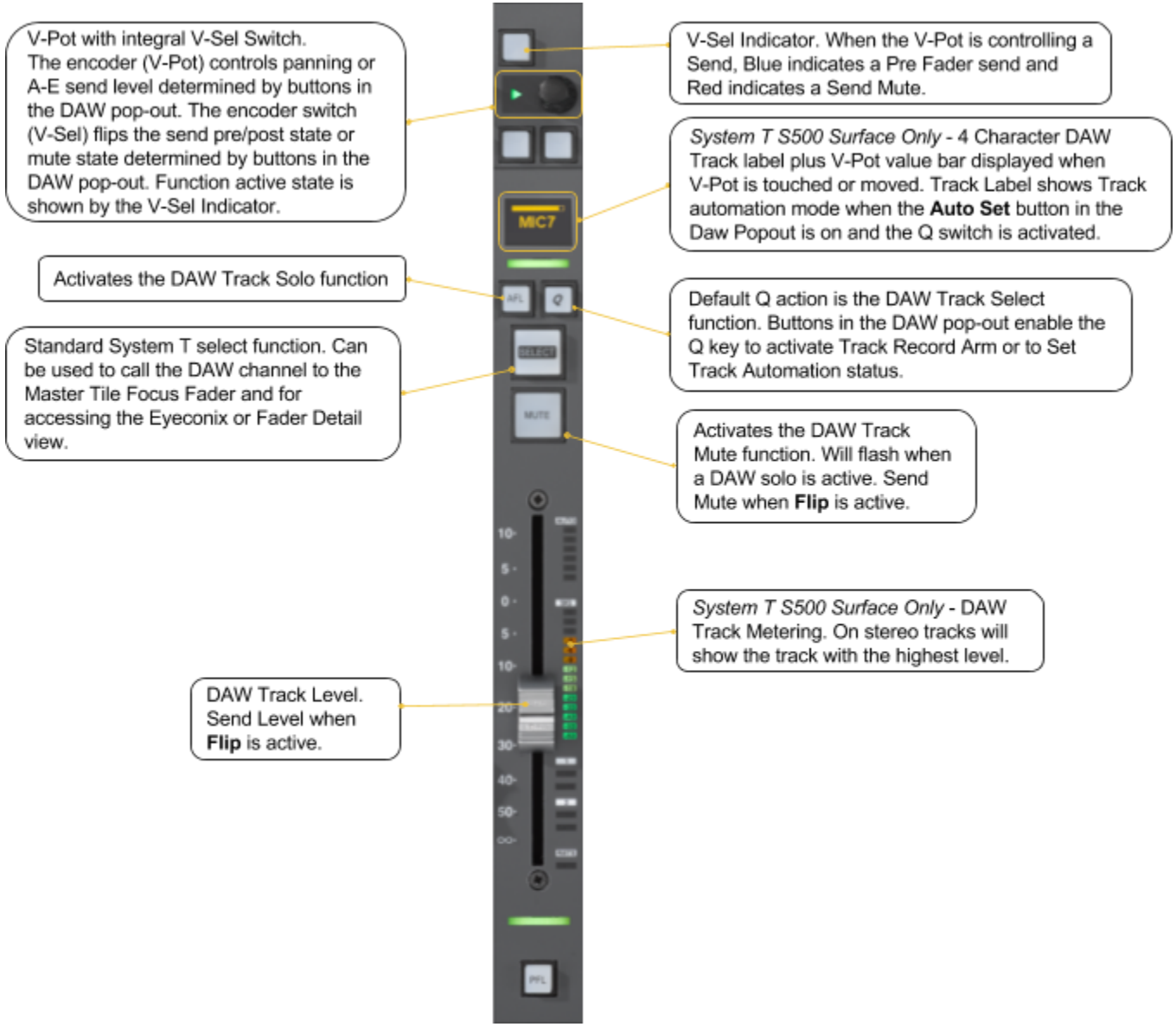
The following functions in Pro Tools can be controlled via dedicated front panel controls or touch screen access on the System T control surface:

- Track
  - Level
  - Mute
  - Solo
  - Stereo Pan
  - Track Arm
  - Automation Mode
  - Sends A-E Level, Pre/Post, Mute and Stereo Pan
  - Fader to 0dB
  - Stereo Meters[2]
  - Channel Label
  - Select
- Session Track Navigation
  - Channel Up/Down
  - Bank Up/Down
- Automation
  - Automation Suspend
  - Fill to Start, End, Mix
- Timeline
  - Stop, Play, Record.
  - Return to Zero
  - Loop
  - Next Marker, Previous Marker
- General Functions
  - All Record
  - Group Suspend
  - Sends to Fader (Flip)
  - Modifier keys: Shift, Opt/All, Alt and Ctrl

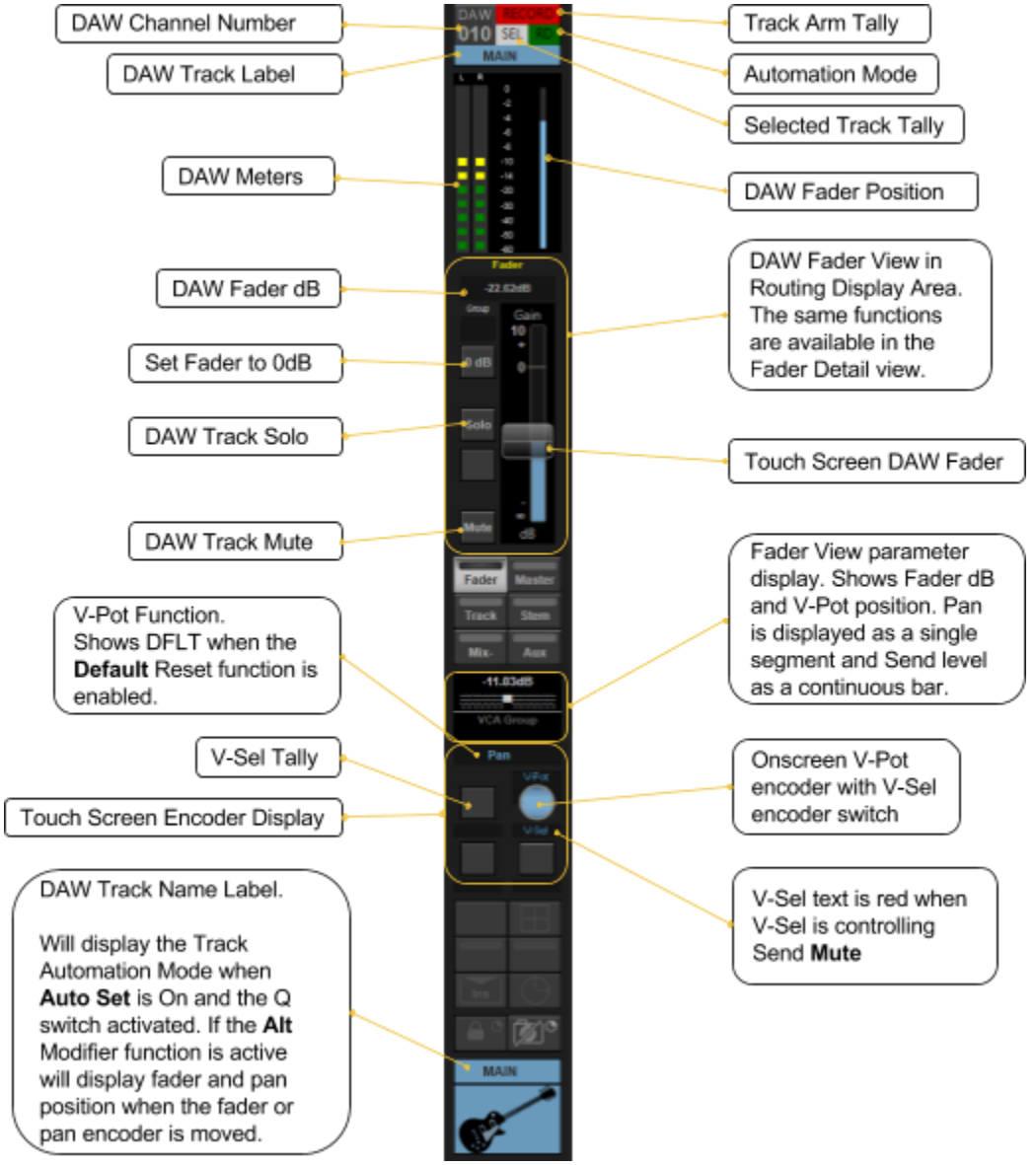
Additional control functions are available as User Keys or Events together with the Master functions listed above.

[2] Metering on a HUI surface is not available if Eucon has been enabled in the Pro Tools Setup/Peripherals/Ethernet Controllers menu.

Fader Tile Control


V-Pot with integral V-Sel Switch. The encoder (V-Pot) controls panning or A-E send level determined by buttons in the DAW pop-out. The encoder switch (V-Sel) flips the send pre/post state or mute state determined by buttons in the DAW pop-out. Function active state is shown by the V-Sel Indicator.
V-Sel Indicator. When the V-Pot is controlling a Send, Blue indicates a Pre Fader send and Red indicates a Send Mute.
System T S500 Surface Only - 4 Character DAW Track label plus V-Pot value bar displayed when V-Pot is touched or moved. Track Label shows Track automation mode when the **Auto Set** button in the Daw Popout is on and the Q switch is activated.
Activates the DAW Track Solo function
Default Q action is the DAW Track Select function. Buttons in the DAW pop-out enable the Q key to activate Track Record Arm or to Set Track Automation status.
Standard System T select function. Can be used to call the DAW channel to the Master Tile Focus Fader and for accessing the Eyeconix or Fader Detail view.
Activates the DAW Track Mute function. Will flash when a DAW solo is active. Send Mute when **Flip** is active.
System T S500 Surface Only - DAW Track Metering. On stereo tracks will show the track with the highest level.
DAW Track Level. Send Level when **Flip** is active.
MIC7
AFL
Q
SELECT
MUTE
PFL

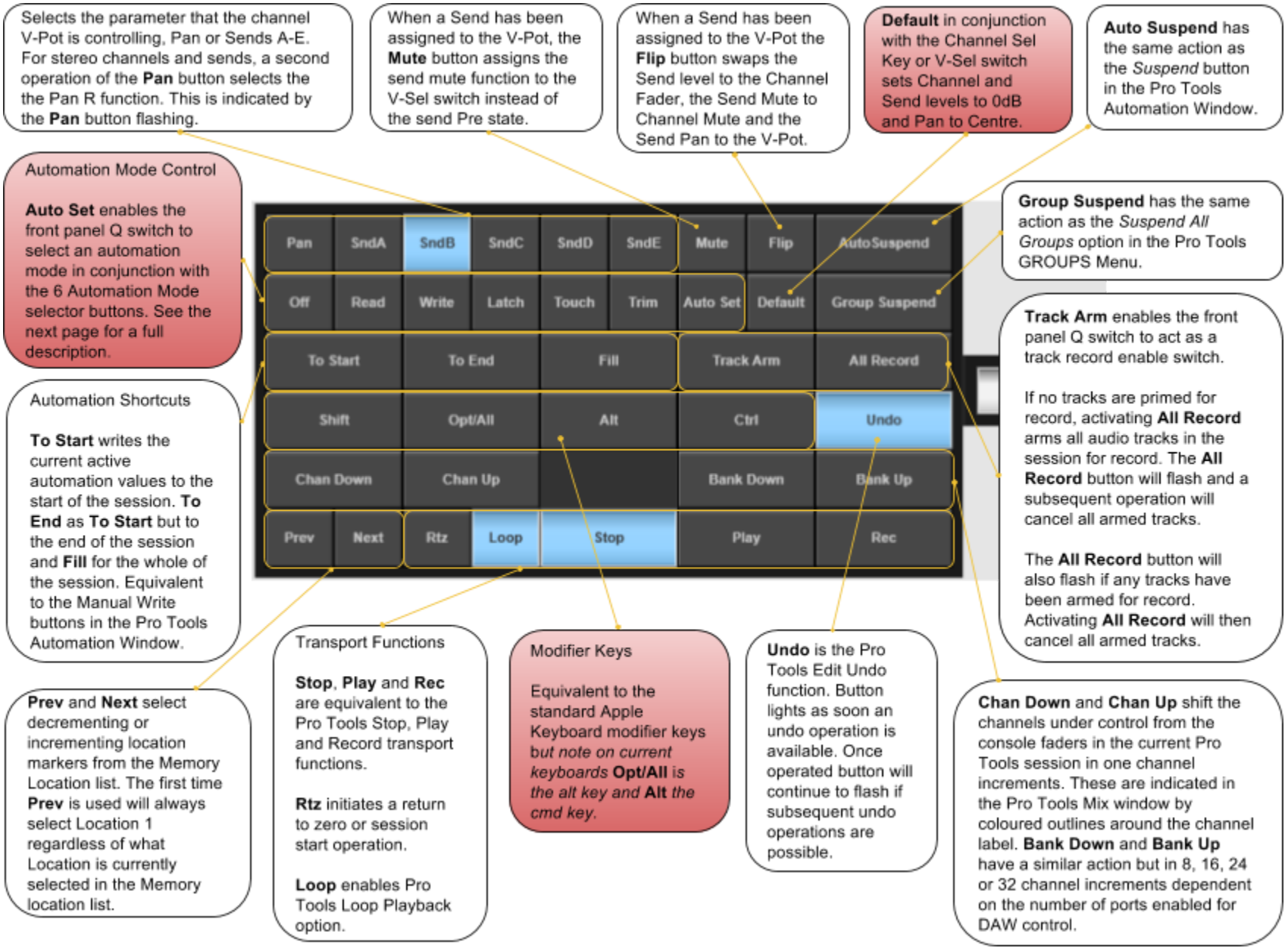
DAW Channel Strip


DAW Channel Number
DAW Track Label
DAW Meters
DAW Fader dB
Set Fader to 0dB
DAW Track Solo
DAW Track Mute
V-Pot Function. Shows DFLT when the **Default** Reset function is enabled.
V-Sel Tally
Touch Screen Encoder Display
DAW Track Name Label. Will display the Track Automation Mode when **Auto Set** is On and the Q switch activated. If the **Alt** Modifier function is active will display fader and pan position when the fader or pan encoder is moved.
Track Arm Tally
Automation Mode
Selected Track Tally
DAW Fader Position
DAW Fader View in Routing Display Area. The same functions are available in the Fader Detail view.
Touch Screen DAW Fader
Fader View parameter display. Shows Fader dB and V-Pot position. Pan is displayed as a single segment and Send level as a continuous bar.
Onscreen V-Pot encoder with V-Sel encoder switch
V-Sel text is red when V-Sel is controlling Send **Mute**

DAW Pop-Out

The new DAW pop-out is accessed via the lower section of the button column to the right of the Channel View.
Push and hold to select which DAW is being controlled from the pop-out via the dropdown menu.

A detailed overview of the functions controlled from the pop-out can be found on the next page.


Selects the parameter that the channel V-Pot is controlling, Pan or Sends A-E. For stereo channels and sends, a second operation of the **Pan** button selects the the Pan R function. This is indicated by the **Pan** button flashing.
When a Send has been assigned to the V-Pot, the **Mute** button assigns the send mute function to the V-Sel switch instead of the send Pre state.
When a Send has been assigned to the V-Pot the **Flip** button swaps the Send level to the Channel Fader, the Send Mute to Channel Mute and the Send Pan to the V-Pot.
Default in conjunction with the Channel Sel Key or V-Sel switch sets Channel and Send levels to 0dB and Pan to Centre.
Auto Suspend has the same action as the *Suspend* button in the Pro Tools Automation Window.
Automation Mode Control
Auto Set enables the front panel Q switch to select an automation mode in conjunction with the 6 Automation Mode selector buttons. See the next page for a full description.
Pan
SndA
SndB
SndC
SndD
SndE
Mute
Flip
AutoSuspend
Off
Read
Write
Latch
Touch
Trim
Auto Set
Default
Group Suspend
To Start
To End
Fill
Track Arm
All Record
Shift
Opt/Alt
Alt
Ctrl
Undo
Chan Down
Chan Up
Bank Down
Bank Up
Prev
Next
Rtz
Loop
Stop
Play
Rec
Group Suspend has the same action as the *Suspend All Groups* option in the Pro Tools GROUPS Menu.
Track Arm enables the front panel Q switch to act as a track record enable switch.
If no tracks are primed for record, activating **All Record** arms all audio tracks in the session for record. The **All Record** button will flash and a subsequent operation will cancel all armed tracks.
The **All Record** button will also flash if any tracks have been armed for record. Activating **All Record** will then cancel all armed tracks.
Automation Shortcuts
To Start writes the current active automation values to the start of the session. **To End** as **To Start** but to the end of the session and **Fill** for the whole of the session. Equivalent to the Manual Write buttons in the Pro Tools Automation Window.
Prev and **Next** select decrementing or incrementing location markers from the Memory Location list. The first time **Prev** is used will always select Location 1 regardless of what Location is currently selected in the Memory location list.
Transport Functions
Stop, **Play** and **Rec** are equivalent to the Pro Tools Stop, Play and Record transport functions.
Rtz initiates a return to zero or session start operation.
Loop enables Pro Tools Loop Playback option.
Modifier Keys
Equivalent to the standard Apple Keyboard modifier keys *but note on current keyboards* **Opt/Alt** *is the alt key and* **Alt** *the cmd key.*
Undo is the Pro Tools Edit Undo function. Button lights as soon an undo operation is available. Once operated button will continue to flash if subsequent undo operations are possible.
Chan Down and **Chan Up** shift the channels under control from the console faders in the current Pro Tools session in one channel increments. These are indicated in the Pro Tools Mix window by coloured outlines around the channel label. **Bank Down** and **Bank Up** have a similar action but in 8, 16, 24 or 32 channel increments dependent on the number of ports enabled for DAW control.

DAW Pop-Out Button Modes

Standard touch button operation is ‘one shot’, i.e. when the button is released the indicated function is actioned. Buttons shown on the previous page with highlighted text descriptions operate in a different manner:

The Modifier Keys

These keys have a latching action so that they can be used in conjunction with other DAW functions. The first operation of the button latches the function on, and a subsequent operation cancels the function.

Automation Mode Control

Auto Set is a toggle function which changes the function of the front panel Q switch to select automation modes in conjunction with the 6 automation mode buttons: **Off, Read, Write, Latch, Touch,** and **Trim** (Pro Tools HD only).

Two modes of operation are possible:

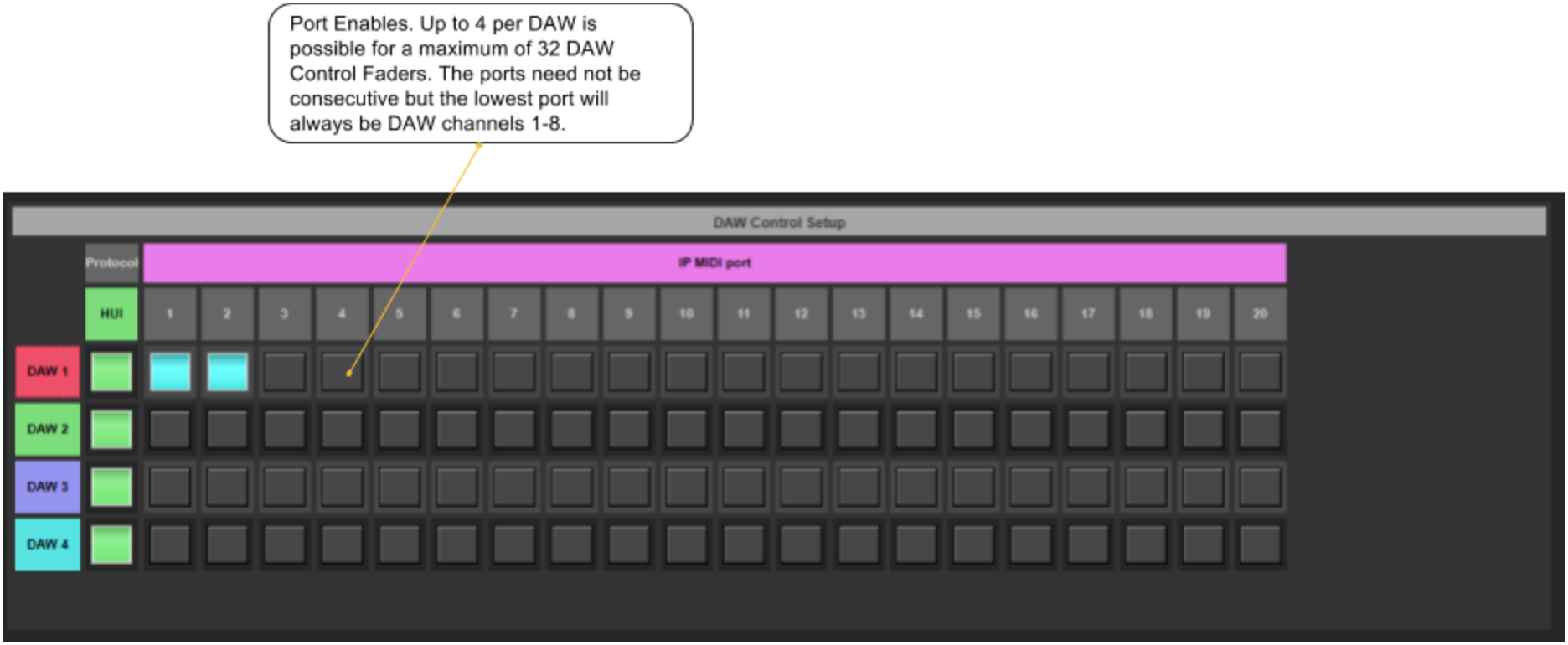
- Hold down the Fader strip Q switch then select the required automation mode using the touch screen button. It will function in ‘one shot’ mode.
- Push and hold an automation mode button and it will latch on. Multiple channels can then be selected to the latched mode via their Q switches. Touch the mode button again to unlatch.

In conjunction with the Modifier Keys, multiple tracks can be set to a specific automation mode:

- **Opt/All** + **Auto Mode** sets all tracks to the selected mode.
- **Shift** + **Opt/All** + **Auto Mode** sets all selected tracks (tip: use the Q key + **Alt** to select multiple non contiguous tracks) to an auto mode.

DAW Control Setup

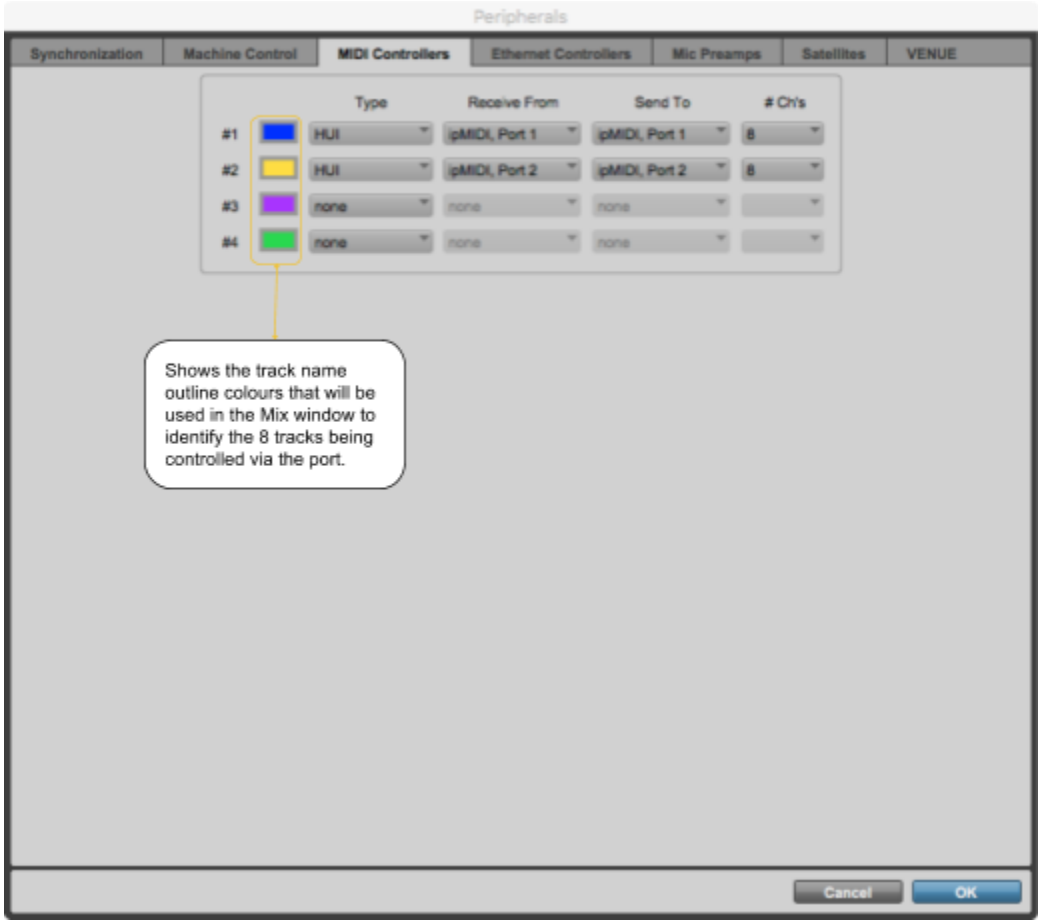
Via the DAW Tab in the Setup/Options page



Select the IP MIDI ports to be used with each connected DAW. A maximum of four per DAW is possible with HUI.

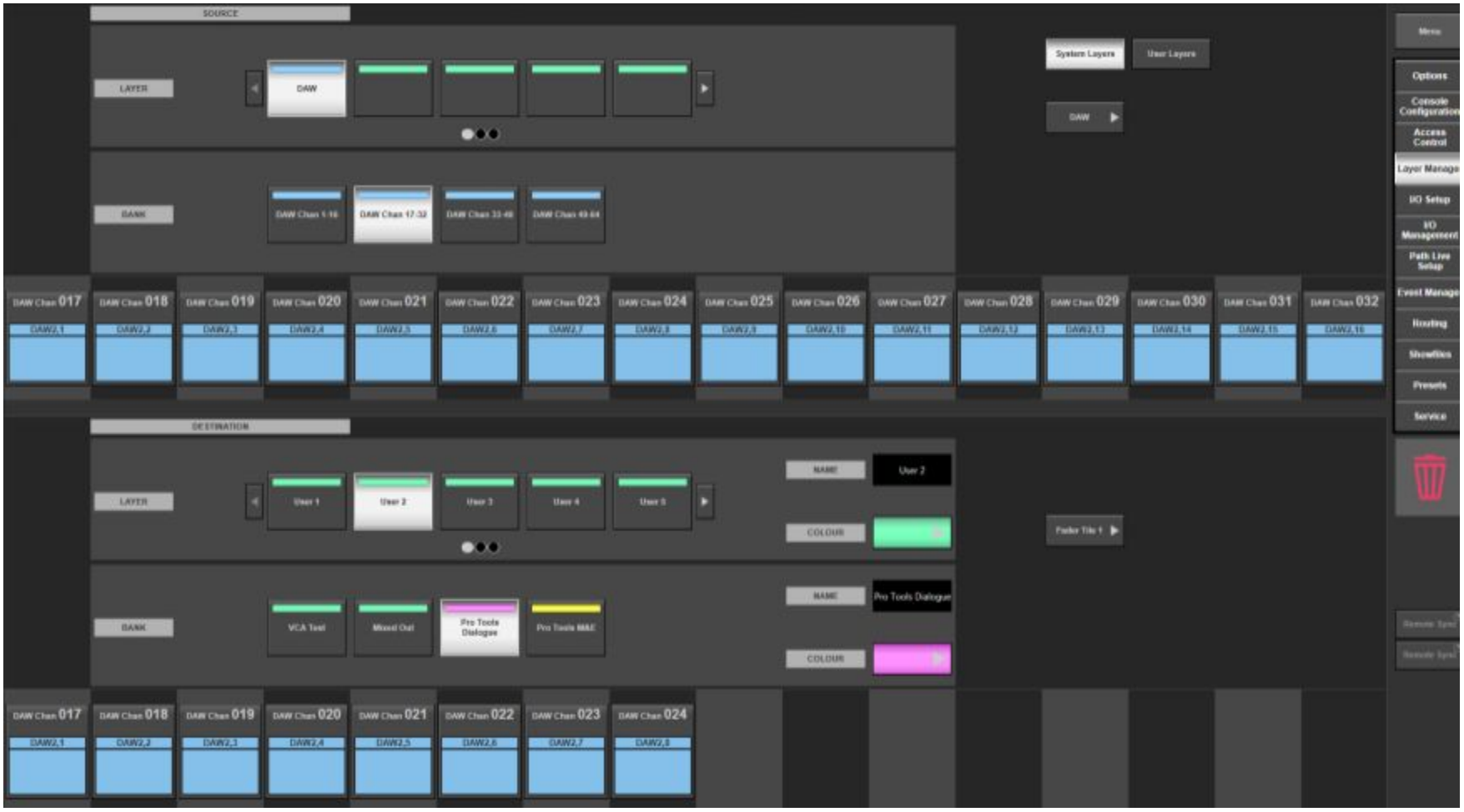
Pro Tools MIDI Controllers Menu

In Pro Tools open the Setup/Peripherals menu and select the MIDI Controllers tab. Enable the HUI Mode on the ports that will be used and then select the same iPMIDI ports that have been set up in the System T DAW Control Setup page.



Configuring DAW Banks

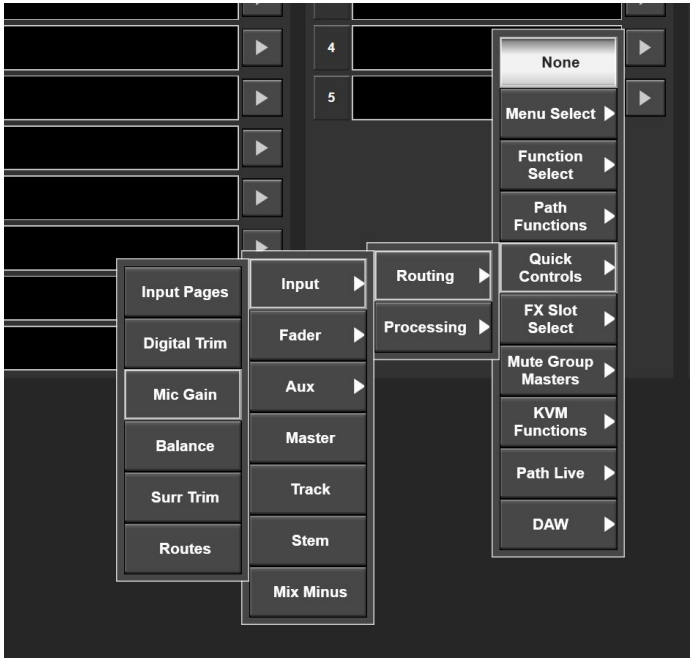
Once the DAW ports have been enabled in the DAW Control Setup page, the DAW controller channels will be visible in the new DAW Channel Source Layer in the Layer Manager. Channels can then be placed in User Banks as required. Note that DAW Channel Label shows the number of the DAW port as well as the channel number. Once connection to a Pro Tools system is established this will be replaced by the four character Pro Tools track label received from the DAW.



Quick Control Function Pages in User Keys

With the quick encoders being used in the horizontal mode (with follow detail off or the channel detail view closed) the different functions of the quick encoders can be accessed by the touch screen buttons (e.g. EQ, Dyn 1, Input, Pan, Master, Stem, Aux, etc) or via the encoder function scroller arrow switches on the fader tile. Within each quick encoder function there are often many possible pages, pressing the encoder cycles through these pages. For example, the input section includes: Digital Trim, Mic Gain, Balance, Surround Trim and Routes pages. The last page that was used on the inputs section can be immediately accessed by touching the input area at the very top of the Channel View, this will navigate all the quick encoders to the last input page used. Pressing and holding the left arrow in the encoder function scroller switches also navigates to the last selected Input page, the right arrow navigating to the last open Pan page.

Depending on the type of show and infrastructure some of the specific function pages will be frequently required by the consoles operator. Navigation to any of these pages can be assigned to User Key functions, greatly speeding up workflow by offering hardware control of the most used features. These user key assignments are stored within the show file allowing full customisation for each operator if required. Typical examples of function page navigation that would be useful to have on user keys are: **Mic Gain** for immediate access to mic controls, **Balance** for immediate access to Mono from L & R on stereo sources and **Automix** for control of in-circuit and weight controls for fast paced panel discussion shows.



The User Key assignment can be found in the **Setup, Option, User** menu. All current pages available as user keys are detailed on the next page.

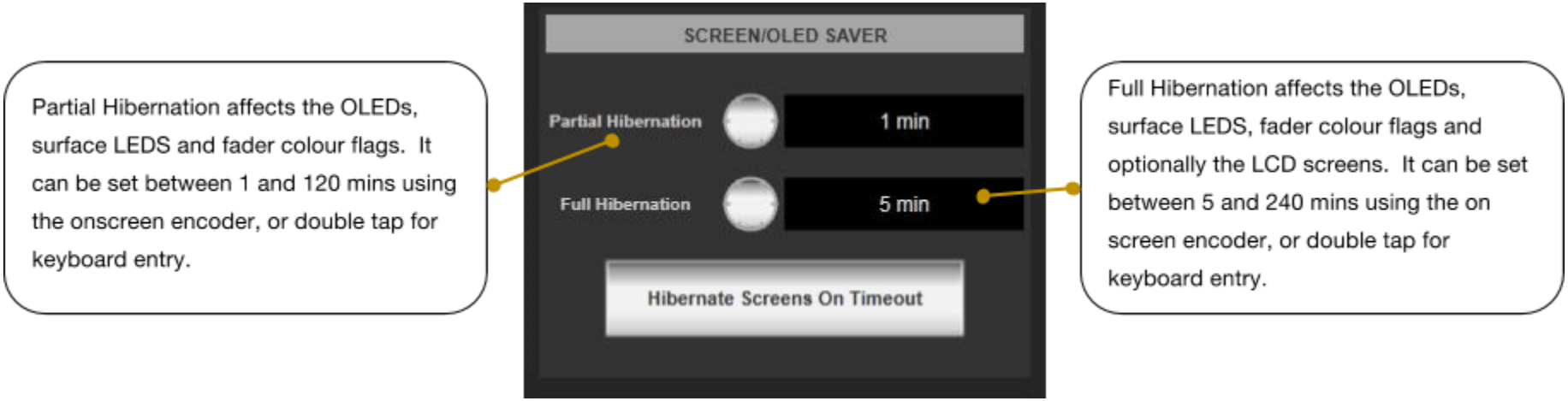
- Routing
  - Input
    - Input Pages
    - Digital Trim
    - Mic Gain
    - Balance
    - Surr Trim
    - Routes
  - Fader
    - Fader Pages
    - Fader Gain
    - 2nd Gain
    - Automix
  - Master
  - Track
  - Stem
  - Mix Minus
  - Aux
    - Aux Pages
    - Send Gain
    - Pan
    - Width
    - Divergence
    - Front/Rear
    - Depth
    - LF gain
- Processing
  - EQ
    - EQ Pages
    - Filters
    - EQ1
    - EQ2
    - EQ3
    - EQ4
  - Pan
    - Pan Pages
    - Pan L/R
    - Pan F/R
  - Dyn 1
    - Dyn 1 Pages
    - Comp
    - Gate
    - DeEss
  - Dyn 2
    - Dyn 2 Pages
    - Comp
    - Gate
    - DeEss
  - Insert
  - Delay

Meterbridge Layout as Part of Showfile

On System T S500 surfaces with a meterbridge installed, the meterbridge layout is now saved as part of the showfile. If a show file is loaded from an old version of software the default console's meterbridge layout will be used. The default layout is a feature that will be deprecated and there are no user options to edit this layout. Upon saving your showfile post V1.8 the showfile will include a meterbridge layout. Note: any changes made in the **Setup, Meterbridge Configuration** screen should be applied in that menu before moving to the **Setup, Showfile** menu and saving the showfile. This ensures any changes to the meterbridge layout are applied to the meterbridge before the showfile is saved.

Screen/OLED Saver Options

System T includes screen and OLED saver options, these can be used to dim or turn off the surface automatically when not in use. The time that System T surfaces take to enter partial and full hibernation are user editable. The LCD screens can optionally be included in full hibernation. Settings are located in **Setup, Options, Surface.** These settings are system stored, and will be the same for all showfiles loaded on the console.


Partial Hibernation affects the OLEDs, surface LEDS and fader colour flags. It can be set between 1 and 120 mins using the onscreen encoder, or double tap for keyboard entry.
SCREEN/OLED SAVER
Partial Hibernation
1 min
Full Hibernation
5 min
Hibernate Screens On Timeout
Full Hibernation affects the OLEDs, surface LEDS, fader colour flags and optionally the LCD screens. It can be set between 5 and 240 mins using the on screen encoder, or double tap for keyboard entry.

The OLED saver cannot be turned off. OLEDs provide a bright and clear display but use an organic material. While System T's OLEDs have been selected to provide the longest possible lifespan, they would need replacing if permanently left turned on for many years. OLED saver and other non user-editable controls have been carefully designed to prolong the life of these parts. All System T consoles utilise high quality LCD screens that do not suffer from burn in, however as with all LCD screens displaying the same static image for long periods of time will leave a temporary persistence, the ability to hibernate the screens prevents this.

Hibernation will be exited as soon as any consoles touch screen or fader is touched, or a surface button is pressed. It will take a few seconds for all of the consoles screens to come out of hibernation.

Console Name

The console name provides a method for other devices on the network to differentiate between each control surface. It is used for the ownership features for Network I/O parameter control and the consoles name shown in T-SOLSA when remotely connecting. The name can be edited from the GUI.

CONSOLE NAME
WARNING: Changing console name will cause the console to power off and lose any Dante Ownership states
PRODUCTS-S300
Apply

New Network I/O Support

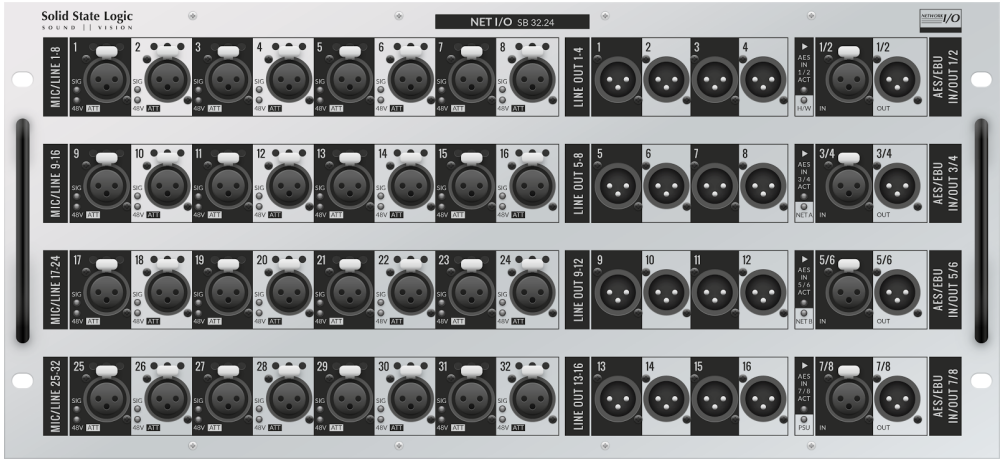
A16.D16 Support

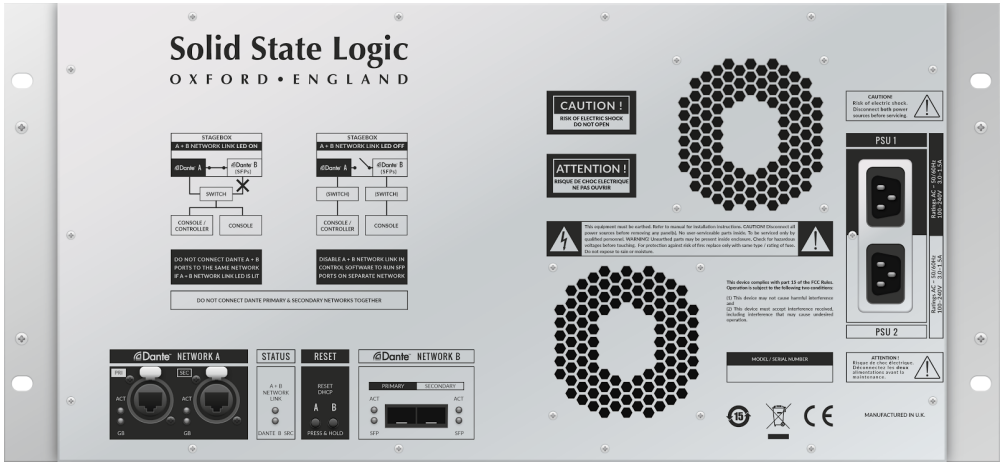
V1.8 introduces support for a new Network I/O device. A16.D16 is a 2U, 32-input and 32-output Dante I/O device featuring 4 SuperAnalogue™ mic/line inputs, 12 line inputs, 8 AES3 inputs, 16 line outputs, 8 AES3 outputs and 4 GPIO connections. All analogue audio, AES audio and GPIO connectors are 25-pin D-type. A16.D16 can be controlled remotely from SSL System T and SSL's Network I/O Controller app for PC. A16.D16 is ideally suited for bulk analogue and AES IO connections from control or machine rooms, featuring a high-density combination of analogue and digital inputs and outputs, GPIO, redundant power and network connections. A16.D16 has two redundant sets of network connections. The Network A ports feature etherCON ruggedised RJ45 connectors. The Network B ports are SFP cages, which can be fitted with either RJ45, single-mode or multi-mode LC fibre connectors. This connectivity would require an additional Dante card and is not currently an available option.

Note: Network B functionality is currently not enabled.

SB32.24 Support

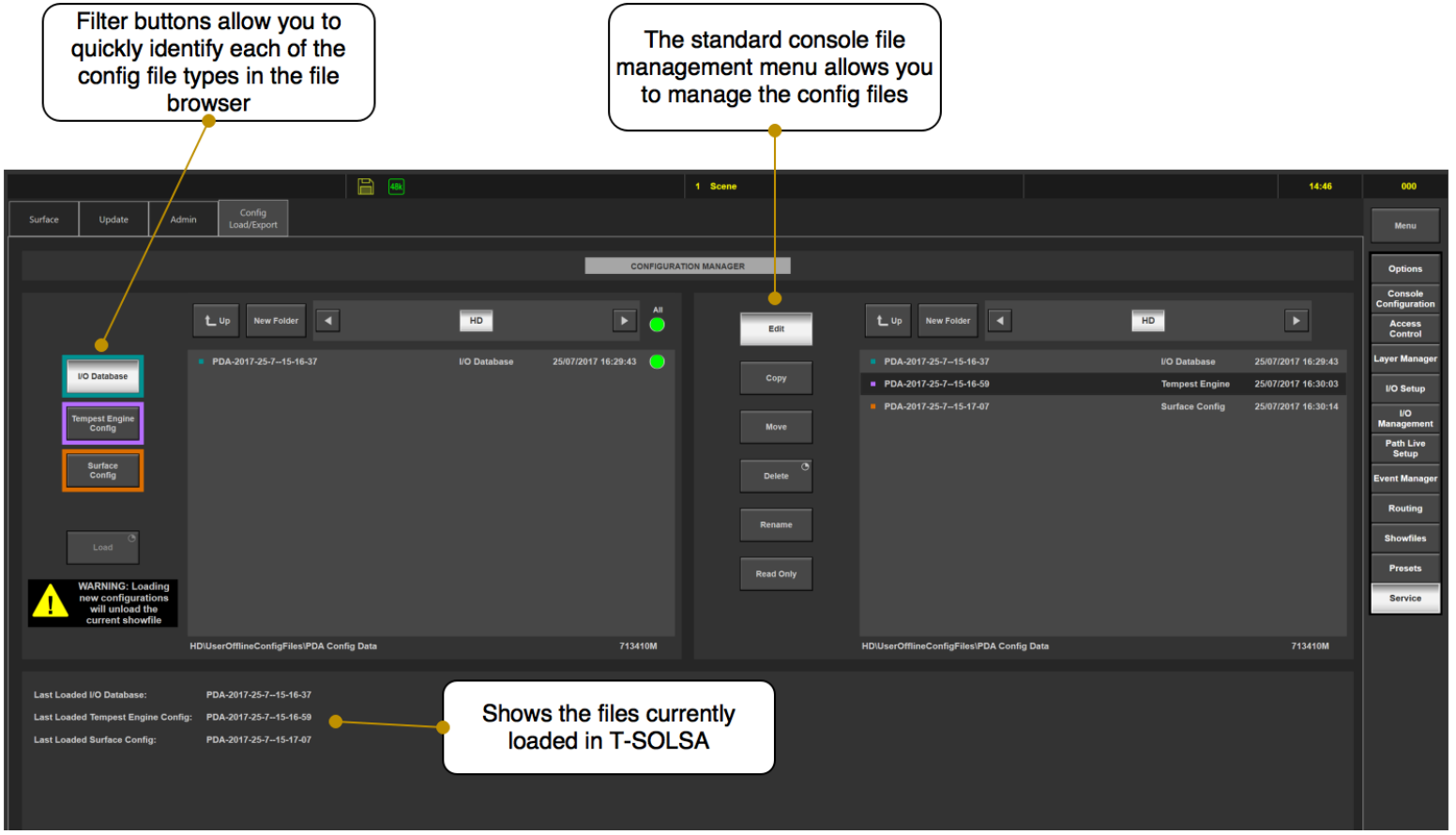
V1.6 introduced support for a new Network I/O Stagebox. SB 32.24 is a 5U, 40-input and 24-output Dante stagebox featuring 32 SuperAnalogue™ mic/line inputs, 4 AES/EBU input pairs, 16 analogue line outputs and 4 AES/EBU output pairs. All analogue and AES audio connectors are XLR-3 type. SB 32.24 can be controlled remotely from SSL Live and System T consoles as well as from SSL's Network I/O Controller app for PC. SB 32.24 is suitable for all high-quality AoIP applications of any scale. SB 32.24 features redundant power, redundant ruggedized etherCON Dante connection plus two user-specifiable SFP ports which provide network extension or support a second independent Dante network.





T-SOLSA Full Offline Mode

T-SOLSA can be used to prep showfiles for specific console surfaces and I/O infrastructures. The console software provides the ability to export the I/O database, Tempest Engine configuration and Surface Tile layout, these can then be loaded onto a PC running T-SOLSA. With an offline copy of these parameters, showfiles built on T-SOLSA will include I/O routing and layer assignment ready for the targeted console surface. To export the console's config files to an external USB storage device navigate to **Setup, Service, Config Load/Export**. The three files will need to be exported separately. Depending on how the system is configured the I/O database may be common to multiple consoles surfaces on a large Dante network. In this case when changing target console surfaces on T-SOLSA you would not need to load an alternate I/O database.



The files include:

- I/O Database
    - Dante devices that have a physical device record on the console
    - Logical Devices - including names and tags
    - Tag Database
- Tempest Engine Config
    - Dante HC and HC Bridge configuration for target engine
    - Virtual Tie Line allocation for Dante HC cards associated with target Tempest Engine
- Surface Config
    - Tile layout of the main surface for the target console

Warning: When loading the config files into T-SOLSA the current showfile will be unloaded and a restart of T-SOLSA will be required to use the new configurations.

T-SOLSA's file browser will allow you to load the files directly from a USB stick. The config files can be copied to your PC's local storage, T-SOLSA's directory for these files is: C:\Users*username*\AppData\Local\SSL\TempestBroadcast\ (replace "*username"* with your own username).

Note: The console shows a live active view of the I/O database, Tempest Engine Config and Surface Config, this feature does not allow you to import these config files into a console. It is designed to allow T-SOLSA to match the target console, not for offline editing of the I/O database.

I/O Management Enhancements

Significant enhancements have been made to the **Setup, I/O Management** features. Multiple logical devices may now be named and tagged at the same time, plus logical devices can now be derived from Virtual Tie Lines, improving how routing can be handled from external control systems and wider AoIP and AES67 networks. Virtual Tie Lines and logical devices will typically be configured as part of the commissioning process, these are stored in the system settings and are retained within the showfile. These settings are exportable with the I/O database for use with T-SOLSA offline.

Editing multiple logical devices at the same time is achieved by using the “Shift/Multi Sel”

When the shift key is selected it is possible to select multiple logical devices by touching within the device area or on the details button. Turning shift off un-selects all devices. Selected devices are outlined with a white border, when multiple logical devices are selected all of these devices are edited at the same time.

Tags

When multiple devices are selected, dragging a tag to any device adds that tag to all the selected devices and dragging a tag away from a device (to the tag area) removes that same tag from any of the selected devices.

Names

In the logical device Details view, double tapping on a selected devices name brings up the keyboard to allow device naming. If multiple logical devices are selected then the names will be appended incrementally.

MIC 1
playback
2 Devices selected, they will be renamed and appended with an incremental number 1 to n in the order shown
MIC 1
Close
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M , .
select
copy
paste
123 @#
space
ok

Logical Devices from Virtual Tie Lines

Logical devices are virtual bundles of physical I/O channels, these are configured in **Setup, I/O management** to represent a connected device as a formatted device in the routing GUIs, e.g. a Server, Mic, CD player, set of speakers, external meter, etc. Virtual Tie Lines (VTLs) are virtual patch points on each Dante HC interface card associated with the Tempest Engine. VTLs are used to provide a method for external routing control systems to route signal to and from console paths. For example, PGM 5.1 routed via the console GUI to VTL 1 - 6 on card 1 would allow an external routing controller to route these Dante transmit channels to anywhere else on the AoIP network. VTLs are also the method to provide console signals as AES67 or Dante multicast sources for wider distribution over the network. It is possible to build logical devices from VTLs so that the user is presented with a logical device in the console routing GUI with a name describing what the VTL is used for. For example, output signals from the console that will be network routed via another control system would be routed to a consoles VTL destination, these could be called “PGM 1 5.1 distribution”, “Aux 1 distribution” etc. and would be presented in the routing GUI with these names and any searchable tags they were given. For VTL sources a set of Matrix inputs may be defined so that the operator knows the source on the fader is a Matrix input.

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System T

V2.0.8 Feature Release Notes

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E&OE

Document Revision History

FIRST DRAFT	Tom Knowles	23rd May 2018

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Introduction

This document covers the features of System T V2.0.8 control software release. Update instructions for V2.0.8 are provided in a separate document.

S300-32 Support

This release supports an additional System T control surface option, the S300-32. The 32+1 fader S300 introduces the ability to have two channel views per user position. This feature is available on both the S300 and S500 control surfaces.

Installation information specific to the S500, the S300 and the TCR can be found in the updated System T Installation Guide. The software is identical across all the System T control devices providing full showfile compatibility across the range.

Control options:

- S500
  - S500 with meterbridge
  - S500 without meterbridge
  - S500 with additional user positions
- S300
  - S300-16
  - S300-32
- Tempest Control Rack (TCR)

Features

Immersive Audio

SSL's immersive audio implementation for System T places support of next-generation immersive audio for ATSC 3.0, Dolby Atmos, and MPEG-H at the heart of the console architecture.

With the emergence of 3D Immersive Audio, in broadcast as well as in film, SSL's 3-axis coordinate panning for System T incorporates 2 or 4 channel overhead speakers into the available channel and bus formats. As well as positioning mono and stereo sources in a 3D soundfield, System T can accept multichannel 3D sources and fine tune their spatial components as they are added to the final production mix. This is essential in multilingual sports productions where effects and ambience multichannel 3D 'beds' will be used extensively as the basis of the individual program mixes.

Supported formats include 5.1.2 and 5.1.4, 7.1.2 and 7.1.4 (with side channels as well as rear channels). A novel 4.0.4 format designed primarily for beds and stems ensures that the centre channel remains exclusively available for dialogue and commentary.

Intelligent downmixing means that conventional 5.1, stereo and mono mixes can be created simply by routing a 3D channel or stem to a suitably formatted master bus. Downmix coefficient control of the overhead (top) to floor (bottom) mix and the side channels to front and rear permits user adjustment of the system derived defaults. An elegant unified approach to divergence processing eliminates the complexity often found in the panning solutions offered on workstations and other digital consoles, which require multiple parameters to determine the balance between the discrete and phantom components of the centre and side channel signals.

Partnering the new 3D channel and bus formats is a 12-channel monitoring section. This includes 49 12-channel monitor inputs, configured as a primary monitor input and two 24-channel preselectors, together with a 12-channel AFL monitor bus, and a pair of 12-channel insert points for external processing and rendering engine returns, offering all the monitoring tools required in a 3D production environment. An additional secondary main monitor output allows use of both conventional monitor speakers as well as a secondary sound bar or other domestic style monitor setup for real world quality checking. A further two stereo Alt outputs can be used for nearfield monitors or for simultaneous secondary program monitoring in multilanguage productions. Independent channel level and delay adjustment is available for both main monitor outputs.

Console Config

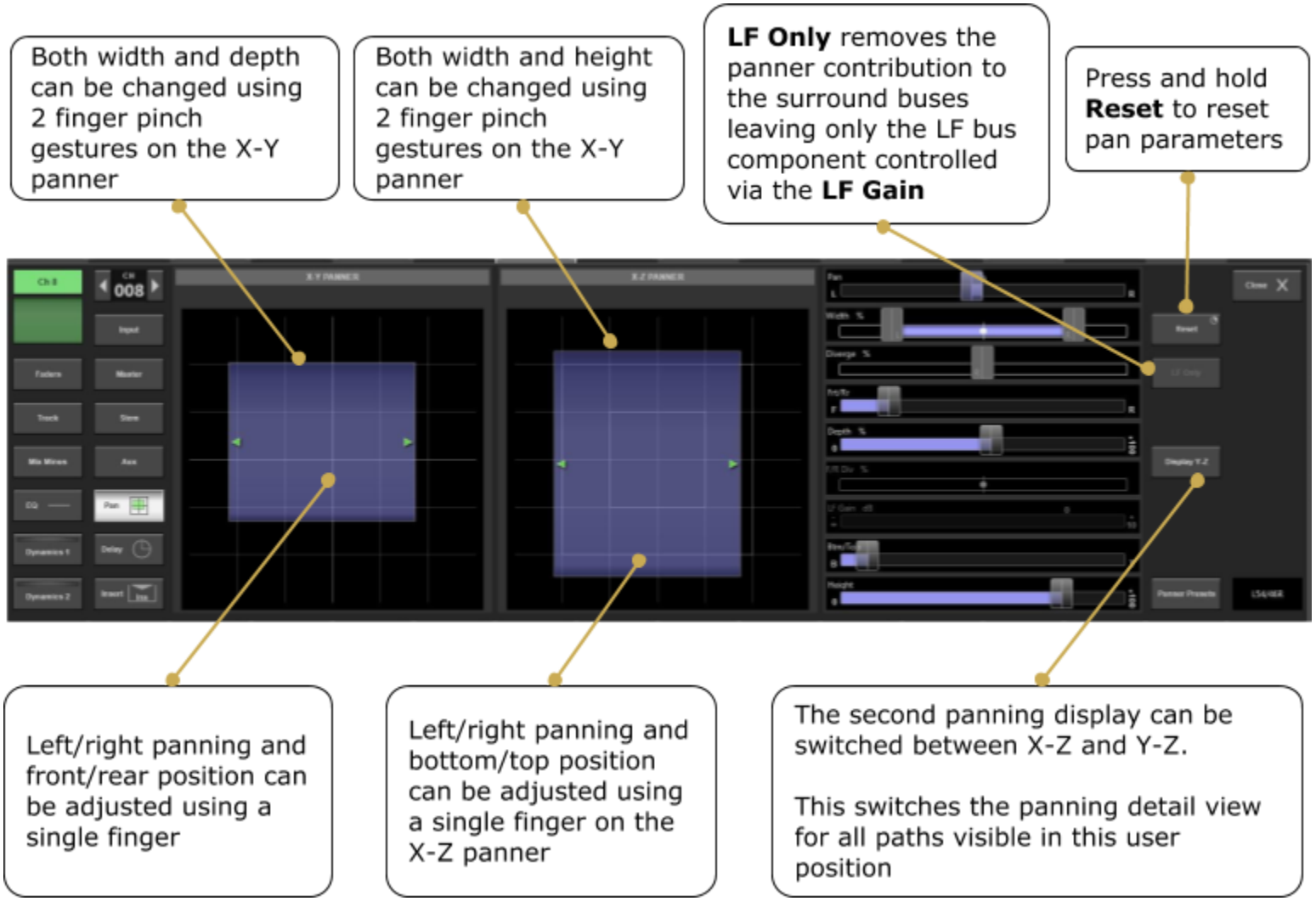
The total number of paths of a particular format can be entered numerically when in edit mode, double tap on the relevant box
Total processing mono equivalent usage
Navigation across the extended format options is via the left and right arrows
Changes will not be applied until the press and hold "apply" actions is used
Change a path format by selecting the radio button when in edit mode and applying the changes
Formated path usage
The format of each path is shown when the path type section is opened
To make changes edit mode must be enabled

The **Menu | Setup | Console Configuration** page allows System T's processing to be completely restructured for each show. At any time, additional path types can be added without interruption to audio currently being processed by the console. The total number of mono equivalent processing paths depends on the Tempest Engine specified (T80 - 800, T25 - 256). Path formats of mono, stereo, LCR, 4.0, 5.1, 5.1.2, 5.1.4, 7.1, 7.1.2, 7.1.4 and 4.0.4 are available for all channels and bus types. There are limits for the number of busses, but these limits are formatted busses not mono equivalents. For example, eight 5.1.4 master busses would use 8 of the 16 master busses available, 80 of the 192 "bus paths" and 80 of the 800 "all paths" processing (on a T80).

Path Metering

Channel View and S500 meterbridge path meters support all the new formats. *Additionally in this release the mono and stereo meter width is increased to improve visibility.*

3D Panning


Both width and depth can be changed using 2 finger pinch gestures on the X-Y panner
Both width and height can be changed using 2 finger pinch gestures on the X-Y panner
LF Only removes the panner contribution to the surround buses leaving only the LF bus component controlled via the **LF Gain**
Press and hold **Reset** to reset pan parameters
Left/right panning and front/rear position can be adjusted using a single finger
Left/right panning and bottom/top position can be adjusted using a single finger on the X-Z panner
The second panning display can be switched between X-Z and Y-Z.
This switches the panning detail view for all paths visible in this user position

A graphical panner provides dedicated X-Y and swappable X-Z/Y-Z GUIs. The parameters available depend on the formats of the selected channel and the bus being routed to. Additional height and bottom/top controls allow you to take an incoming immersive bed and position this in a new immersive mix. These controls can be managed from the onscreen sliders or the touch and pinch graphical display.

The pan parameters available depend on the formats of the channel and busses being routed to. Note that the format of AFL 1 can support all the available pan formats and all channels and stems will enable the appropriate panning parameters to be able to correctly route to the format of AFL 1 even when not soloed or routed to any other busses. This provides a true 3D AFL of any path including all panning if desired.

Pan moves a mono signal left and right. For signals with left and right components pan is progressively proportional to the width parameter.

Width is available when both the channel and bus have left and right components. The control has a range of 100% to -100% reducing the width of a stereo signal to mono at 0%. As the width becomes negative the image is widened back to full stereo but inverted. For buses with a center component, as the Width is reduced the mono component is redirected to the centre channel. A reversed image is indicated by the arrows in the display turning red. If Width is 100% or -100% the L/R Pan has no function. As Width is reduced, the L/R Pan acts as an image offset, by shifting the narrowed stereo image between the edges of the soundfield. If the Width is 0 (mono), the L/R Pan acts as conventional mono pan pot.

Divergence is available when the bus has left, right and centre components. As Divergence is increased, the centre channel is progressively added to the left and right busses, at the same time reducing the centre channel gain. 100% Divergence provides a true phantom stereo image. When the channel has left and right components, Divergence interacts with Width to determine whether the narrowed stereo image has a phantom or discrete centre component.

Frt/Rr is available when the channel or stem does not have a rear component and is routed to a bus which does. It acts as a surround panner moving the signal forwards and backwards in the soundfield.

Depth is available when both the channel or stem and bus have rear surround components. Depth acts as a differential balance control for the rear channels in relation to the front channels. As the Depth is reduced, the rear channels are proportionally added to the front channels while being attenuated in the rear channels. As with Width, the Frt/Rr pan progressively acts on the reduced soundfield.

F/R divergence is for the side speakers i.e. valid 7.1, 7.1.2 and 7.1.4 formats only, and determines the % of signal sent to the side speakers. 100% divergence is equivalent to 5.1, i.e. no signal is sent to the side speakers when the front/rear position is F50/50R, the signal is distributed 50/50 between the Front and Rear speakers. 0% divergence means that the side speakers receive the full signal at F50/50R position.

LF Gain is available when the bus has an LFE component, it provides a level control for the channel contribution to the LFE bus.

Btm/Top is is available when the bus has height components, moving the signal up or down in the 3D sound field provided the channel or stem does not have a height component.

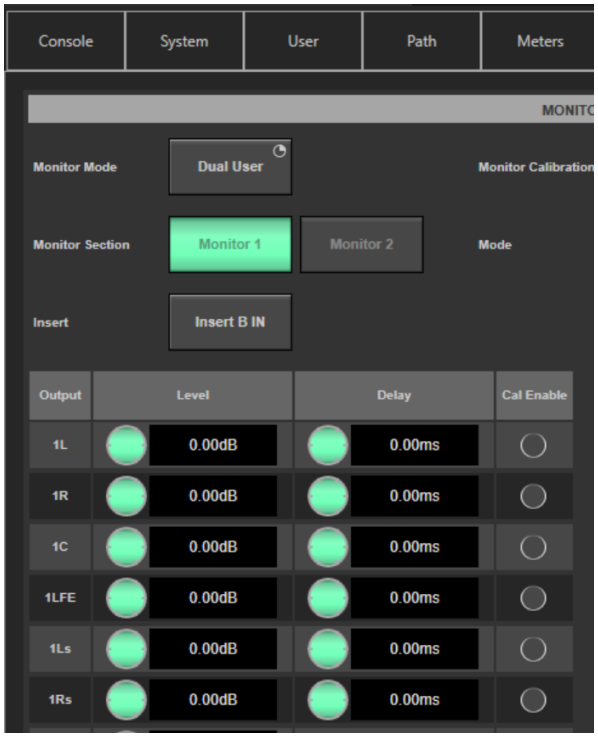
Height is used on channels and stems with a height component that are routed to busses with height components, i.e. the 5.1.2, 5.1.4, 7.1.2, 7.1.4 and 4.0.4 formats. It is equivalent to the Depth parameter that is used to collapse a 5.1 channel in the horizontal plane but Height acts in the vertical plane. As with Depth which collapses the sound field from the rear, the Height initial value is 100% and collapses the sound field from the top as it is reduced, eliminating the height component entirely at 0%. As with Width and Depth, Btm/Top becomes progressively active as the Height is reduced.

LF Only is available on any path with a format that does include an LF channel when routed to a bus with a format that does include an LF channel. Activating LF Only removes all contributions to the other buses leaving the path feeding the LF bus only via the LF Gain parameter. For stereo and above formats the path legs are summed prior to feeding the LF Gain control.

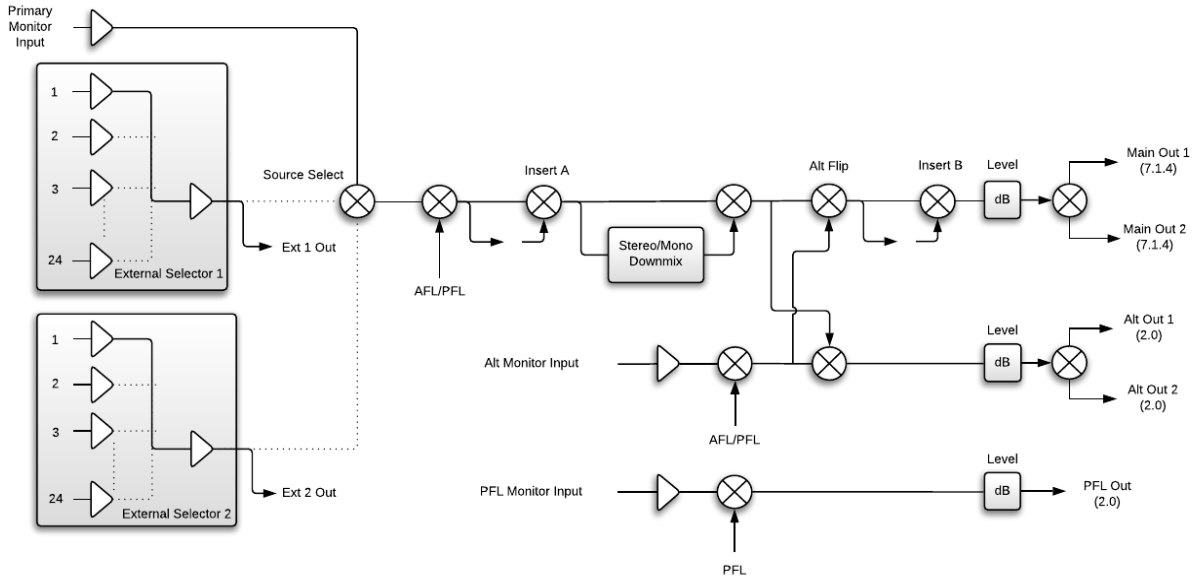
Fold Down

New additional main and alternate fold down coefficients for the side and top channels mean that standard 5.1, stereo and mono mixes include the precise amount of overhead or side contribution simply by routing the immersive channel or stem to a 5.1, stereo or mono bus. This greatly simplifies the process of simultaneously providing immersive and standard 2D program feeds. The alternate fold down coefficients can be enabled via the Eyeconix Detail view on Channels and Stems, in the Monitor section Misc Pop out, and on the small screen Monitor page.

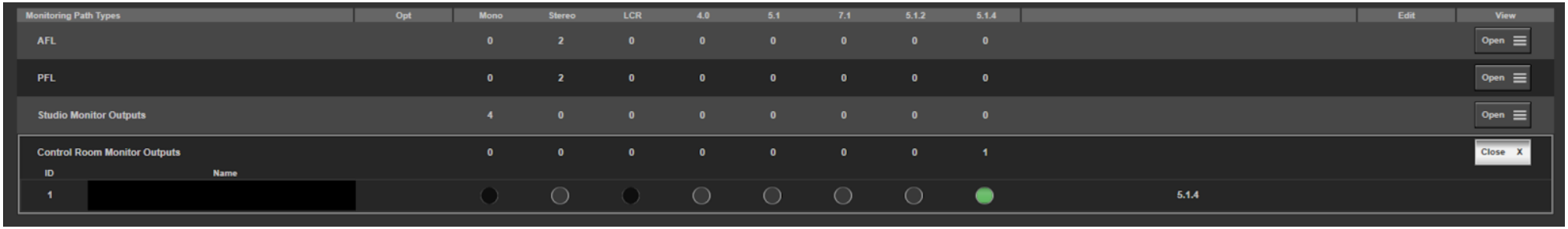
Monitor Section



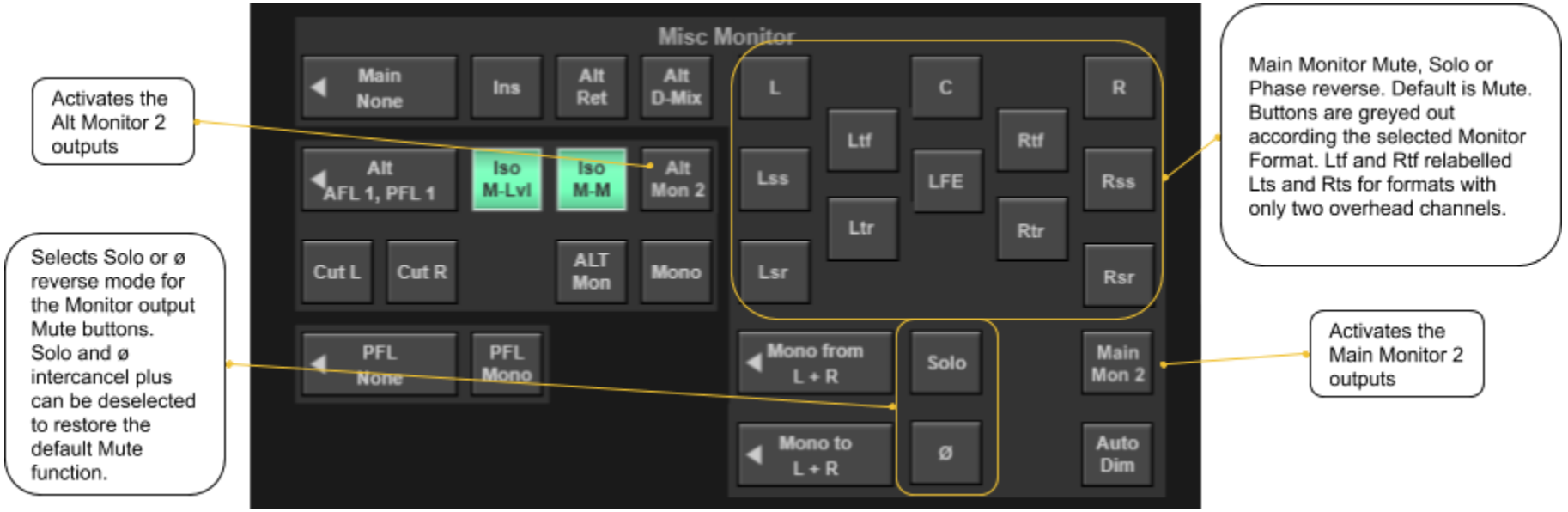
The monitor section can now be set up in two modes. Dual User mode (the mode available pre V2.0) with two full 5.1 monitor sections and a new default monitor mode with a single monitor section with upto 7.1.4 capability. Both modes now support additional speaker sets for the main and alternate speaker outputs, satisfying the requirement for multiple reference speakers often needed for music and post production applications.



When in **Dual User** mode, each surface, remote **T-SOLSA** or user position can be set to monitor 1 or monitor 2, this will automatically provide that position with control of the correct monitor section. With **Dual User** mode off all user positions and remotes control the same monitor section. The monitor sections, AFL and PFL busses are formatted in the **Setup | Console Configuration** pages in the same way that channel and bus paths are formatted. The monitor format and majority of other monitor section functions are saved per system, not per showfile, allowing showfiles to be moved easily between control rooms with different monitor setups.



The **Channel View | Misc Monitor Popout** includes an expanded Monitor Mute section, together with mode buttons to activate the Solo mode and the ø invert options, plus controls to switch to the Main 2 and Alt Monitor 2 outputs. Activating the Monitor 2 output is also possible via the front panel Monitor Level encoder switch as well as the small screen Monitor page (S500 only). The arrow next to the Monitor level encoder indicates the active output for the selected Main or Alt monitor, with green being 1 and blue 2.



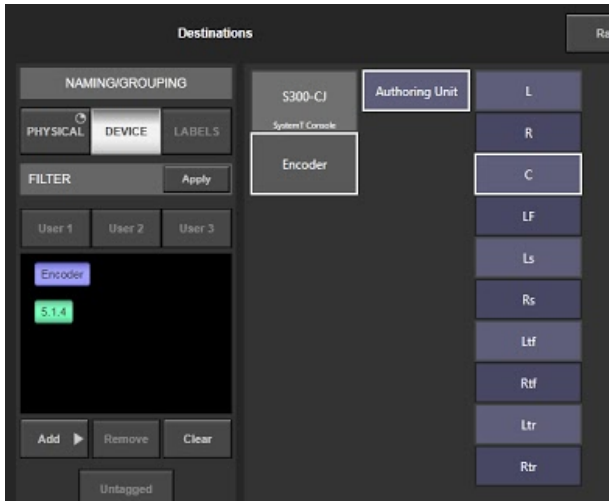
A **Solo Cancel** feature is included in **Setup | Options | Monitor**. **Solo Cancel** is primarily for use with immersive audio formats where the outputs of an external monitor format rendering unit will be returned via the insert points. Enabling Solo Cancel ensures the console AFL or PFL bus can be heard directly on the monitors bypassing any rendering unit.

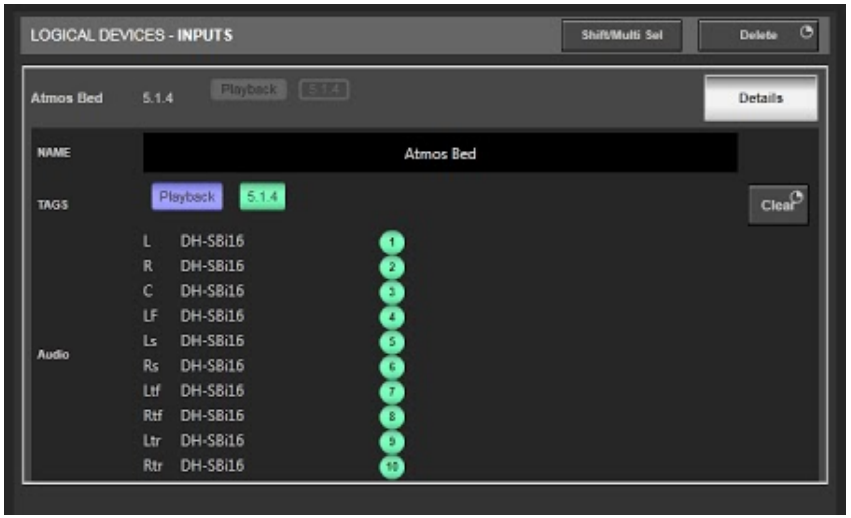
The **Alt Return** monitor option also can also be overridden by an active solo, so that it can be used for monitoring a stereo mix when simultaneous 5.1 and Stereo mixes are being generated via separate master buses.

Monitor section key features

- Up to 12 channels to support 7.1, 5.1.2, 5.1.4, 7.1.2,7.1.4 and 4.0.4 monitor formats
- 4 sets of monitor speakers: 2 x 7.1.4, 2 x Stereo
- Dedicated stereo PFL monitor output
- Simultaneous monitoring of two independent program feeds
- External Source selector outputs available as routable sources
- Individual polarity invert on all main outputs
- Active Solo Insert and Alt Stereo Monitor override
- 7.1.4 to stereo fold down
- Format configurable outputs and inputs

Immersive I/O Management





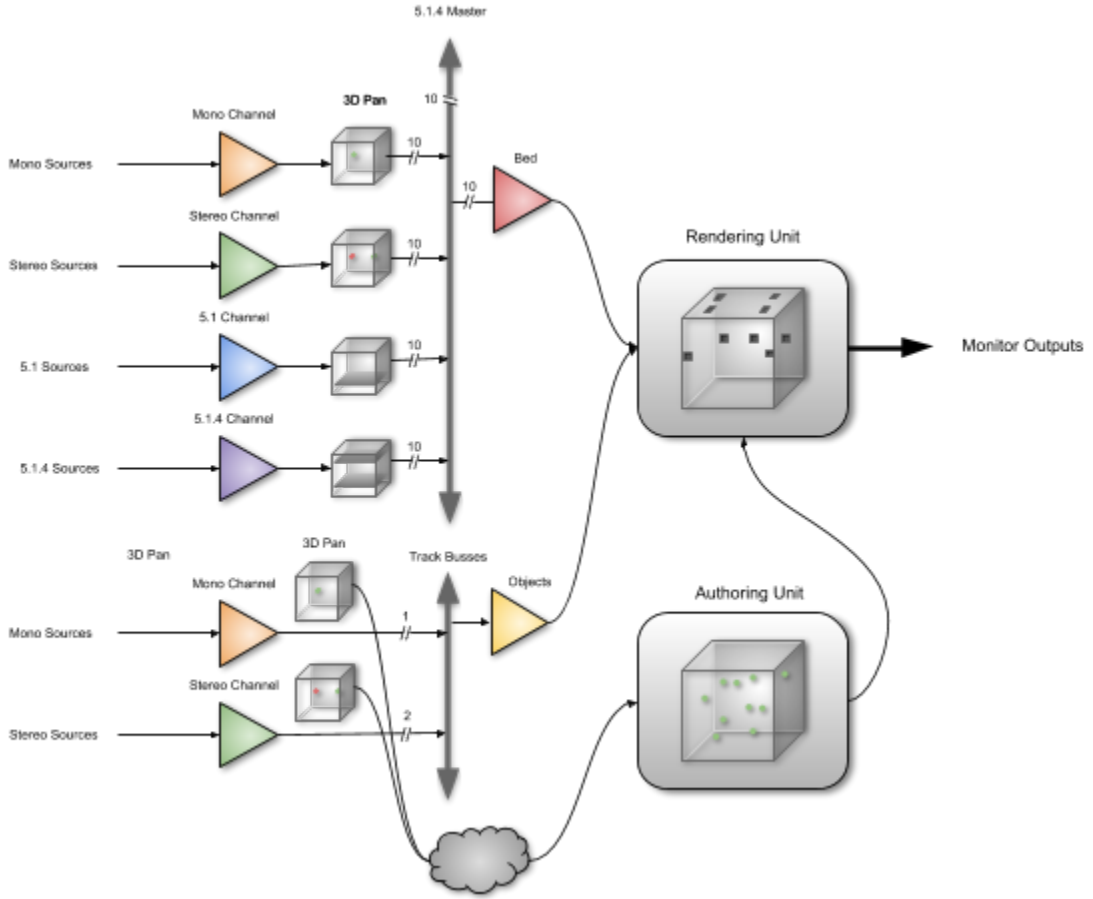
I/O management, grouping, tagging and routing of immersive formats is handled in the same way as any other format.

Immersive FX Rack Processing

In addition to all the standard path processing (EQ, Filters, Dynamics 1, Dynamics 2, Delay) including up to 7.1.4 processing, the FX rack includes immersive format versions of the Bus Compressor, Multiband Compression, Enhancer, Dynamic EQ, G-Flex EQ, All Pass Filter, De-Noiser and Summing Module.

Object Based Production Workflow Overview

System T's immersive audio capabilities are ideal for use within Dolby Atmos or MPEG-H workflows. For these object based productions System T will be paired with third party rendering and authoring units.



The bed is derived from various input channel formats in conjunction with the expanded bus formats and panning options available in V2. Object channels would use mono or stereo track buses or direct outputs. Both the bed and the object channels are routed to the input of the rendering engine where positional or descriptive information is encoded via the authoring unit.

The monitor outputs from the rendering engine are then returned to the new System T 12-channel monitor section either as an external monitor source or via the monitor insert returns.

The diagram shows a cloud where there is a possible future feature. This will require metadata standards to provide the authoring unit information about the object, e.g. positional data or potentially the description information required. Today this information will need to be provided to the authoring unit by alternate means. This is typically a text user entry for descriptive information and positional objects are manually set using the authoring units own panning interface (remember panning is currently static for objects in Dolby Atmos for home). No metadata standard to achieve a real time communication of this positional or descriptive information between the consoles and authoring unit exists. There are a number of potential standards in discussion.

Appification

'Appified' software provides a far greater flexibility and modularity to control software. Components launch as separate applications, and all apps are available anywhere across multi-screen control surfaces and PC control stations.

The five user interface apps on the main surface and T-SOLSA currently available are:

Channel View - The primary user interface for consoles operation including metering, processing, bus routing, etc.
Setup - The configuration menus of the console and connected IO infrastructure.
Scene Automation - Where scenes stored within each showfile are managed.
Overview - A view that provides information for up to 256 formatted paths. With inputs, outputs and tile views this app is great for providing a visualization of signals within large showfiles, immediately highlighting paths that are clipping, muted, faded up or down.
Effects - Contains 96 FX slots for use with a suite of SSL FX and tools that can be inserted into channels and busses, or simply routed to/from.

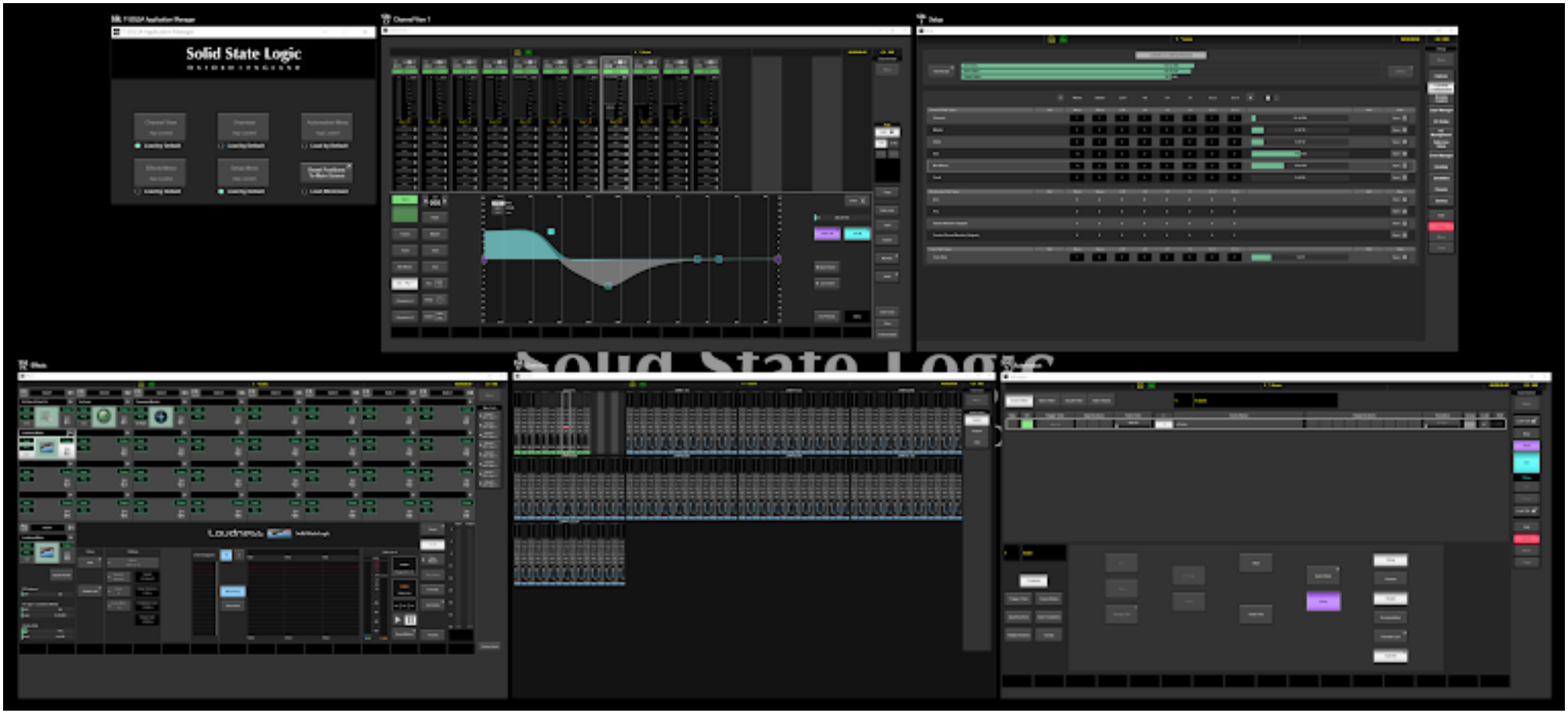
On surfaces with two main screens (S300-32 and S500 layouts larger than 2.5 bays), two instances of the Channel View are available - see Dual Channel View details later in this document. These five apps can be called to any console surface screen using the menu button in the top right corner. Additionally the Channel View can be brought to view in that screen group (the screen associated with the fader tiles around it) using the "call to screen" button on the fader tile. Any menu can be opened on the main left screen of the surface using the user keys to recall specific apps or menus within the setup app.

Note: An S300 surface with an external screen can call the Setup, Automation, Overview and Effects apps to the external screen, but not the Channel View app. The external screen does not have fader tiles associated with it and is not part of a screen group within a console.

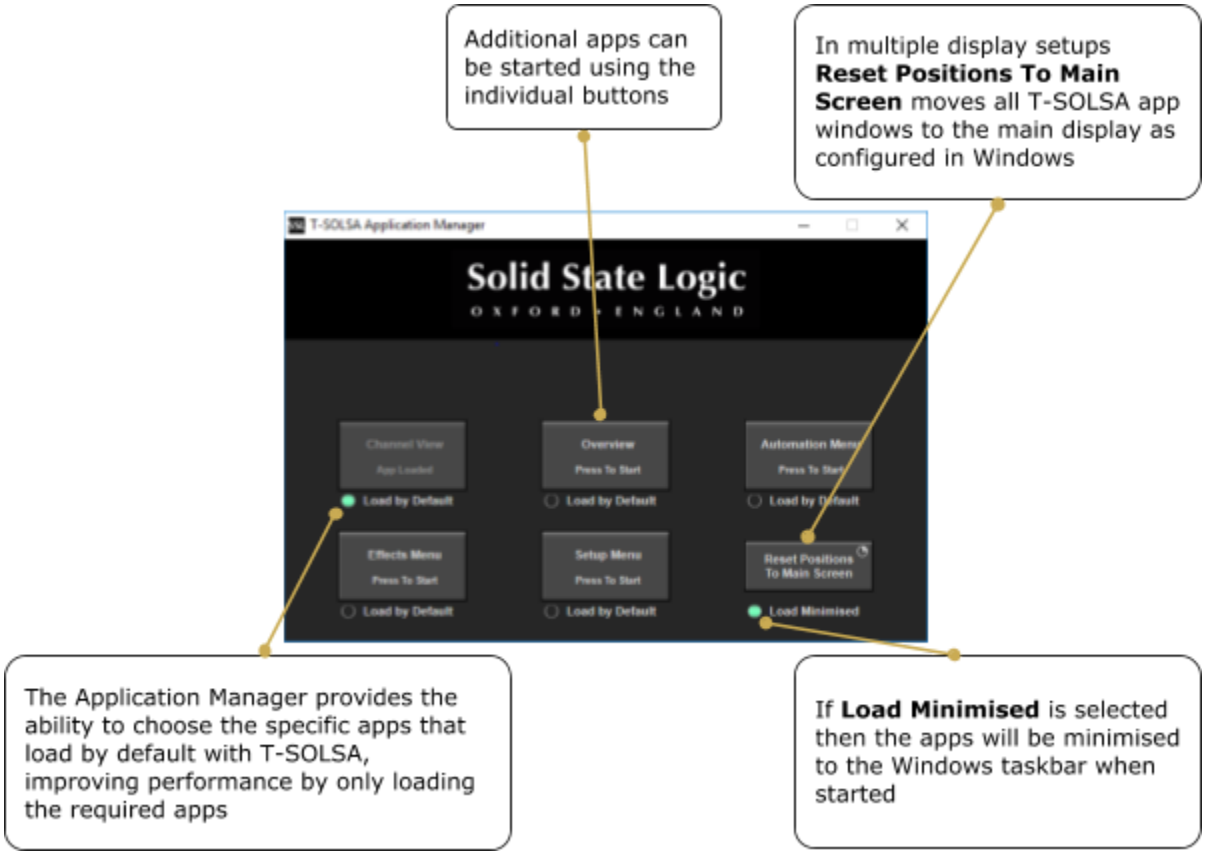
Appification allows the same console surface to be used in many configurations, to suit multiple different types of broadcasting. A simple news show can present the required signals on the surface at all times with signal metering and bus routing always visible, utilising two **Channel Views** and routing "**View**" mode. A complex entertainment production can use the large Scene **Automation** display to move through each band alongside the **Overview** display showing every audio input available with immediate clipping indication. Computers running **T-SOLSA** in remote connectivity mode can be used around the console to provide a simultaneous view of all the console's apps.

T-SOLSA

T-SOLSA also benefits from appification, each app loads in a different window and can be positioned across multiple video outputs or high resolution monitors to provide a dashboard view of all apps while offline or remotely connected to the console. Navigating between the apps is now via the Windows taskbar or “win + tab” or “alt + tab” shortcuts. The “menu” button previously used on T-SOLSA for navigating between Channel View, Setup, Automation, Overview and Effects is no longer featured in T-SOLSA.



On starting T-SOLSA the Application Manager will load. The Application Manager provides the ability to choose the specific apps to run - including which load by default with T-SOLSA - improving performance by only loading the required apps. On startup the apps will return to their previous display locations.

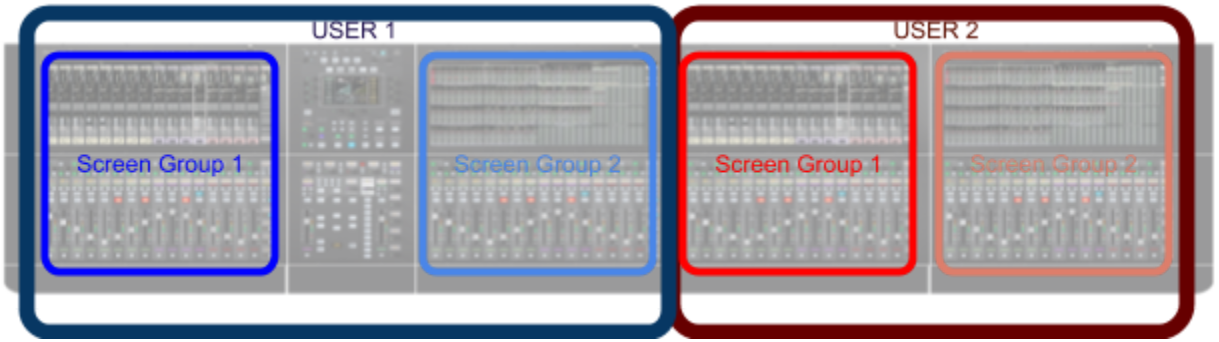

Additional apps can be started using the individual buttons
In multiple display setups **Reset Positions To Main Screen** moves all T-SOLSA app windows to the main display as configured in Windows
T-SOLSA Application Manager
Solid State Logic
OXFORD ENGLAND
Overview
Press To Start
Load by Default
Effects Menu
Setup Menu
Reset Positions To Main Screen
Load Minimised
The Application Manager provides the ability to choose the specific apps that load by default with T-SOLSA, improving performance by only loading the required apps
If **Load Minimised** is selected then the apps will be minimised to the Windows taskbar when started

Dual Channel View

On an S300-32 or S500 with 2 screens in a user position the software now allows two simultaneous **Channel View** apps. **Channel View** is the primary operational interface, dual **Channel View** greatly improves the speed and functionality of the System T control surface software providing greater visibility of signal metering, processing parameters and bus routing for more paths at the same time.

Each **Channel View** is associated with a set of fader tiles in a Screen Group. The Screen Group includes the fader tile immediately below the screen and those in a bay adjacent to the screen that doesn't included a screen in that bay.

Pressing the **Call to Screen** button on a fader tile brings the channel view for that fader tiles current bank to the screen within its screen group.



Both **Restrict to one Channel View** and **Anchor Channel View to current location** are stored within the showfile. In large multi user S500 surfaces or when surfaces are connected in remote mode these settings are stored for each surface or user position.

With dual **Channel View** the console has a single selected **focus fader.** The focus fader path can be selected using the fader tile select key, touching the path on the **Channel View** or **Overview** screen, plus navigating up and down paths in the **Detail View** or S500 small screen channel displays. The **Channel Detail View** always follows this selected path and therefore only one channel detail can be open at any one time. If the channel detail is already open in Screen Group 1, double tapping on the lower context window or Eyeconix area for a path in screen group 2 will select this path, close the Detail View on screen 1 and open the Detail View on screen 2. In large multi-user S500 surfaces or when surfaces are connected in remote mode, each surface or user has independant Channel Detail views. Both the selected path and Channel Detail View are considered a per surface or per user position function.

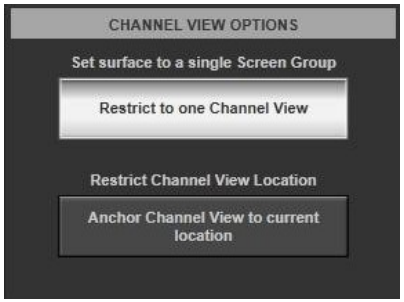
In contrast the spill function is per Channel View. When two Channel Views are displayed, paths within either GUI can be spilled independently.

Features that are per surface or per user position in large S500 surfaces include:

- Horizontal **quick encoder** and bus routing **view** mode selection for the upper and lower context windows
- **Lock** function for the upper context window to prevent accidental bus routing or fader changes from the touch screen
- **Copy** and **Path Link** enable - these features act on the selected focus path
- **Query**
- **Channel Detail View**

Features that are independant per Channel View include:

- **DAW control pop-out**
- **Monitor pop-out**
- **Layer Select pop-out**
- **Copy** processing element and bus selection
- **Spill**


CHANNEL VIEW OPTIONS
Set surface to a single Screen Group
Restrict to one Channel View
Restrict Channel View Location
Anchor Channel View to current location

In **Setup | Options | Surface** you can set the surface to a single Screen Group and anchor the **Channel View** to a specific screen. Restricting to a single **Channel View** will allow the surface to function as it did pre V2.0, in which **Call to Screen** and **Screen Follow Select** intelligently switched the **Channel View** to the screen associated with the tile being used.

Anchor Channel View to current location replaces the KVM lock function. Depending on the S500 surface layout and the type of production the operator may want to keep a single Channel View anchored in a central position on the surface.

Query to Focus Fader

An option that automatically puts the queried fader to the focus fader, displaying the query results on all of the channel fader tiles. This feature is intended for use on 16 fader surfaces such as the S300-16 or 16 fader S500 surface. It can be enabled or disabled in **Setup | Options | Surface**.

When enabled, a queried channel will move to the focus fader and the fader tile layers will be replaced with all channels that are routed from/to the queried channel. To clear the query function the Q button must be pressed from the focus fader as the source channel will no longer be present on the fader tile.

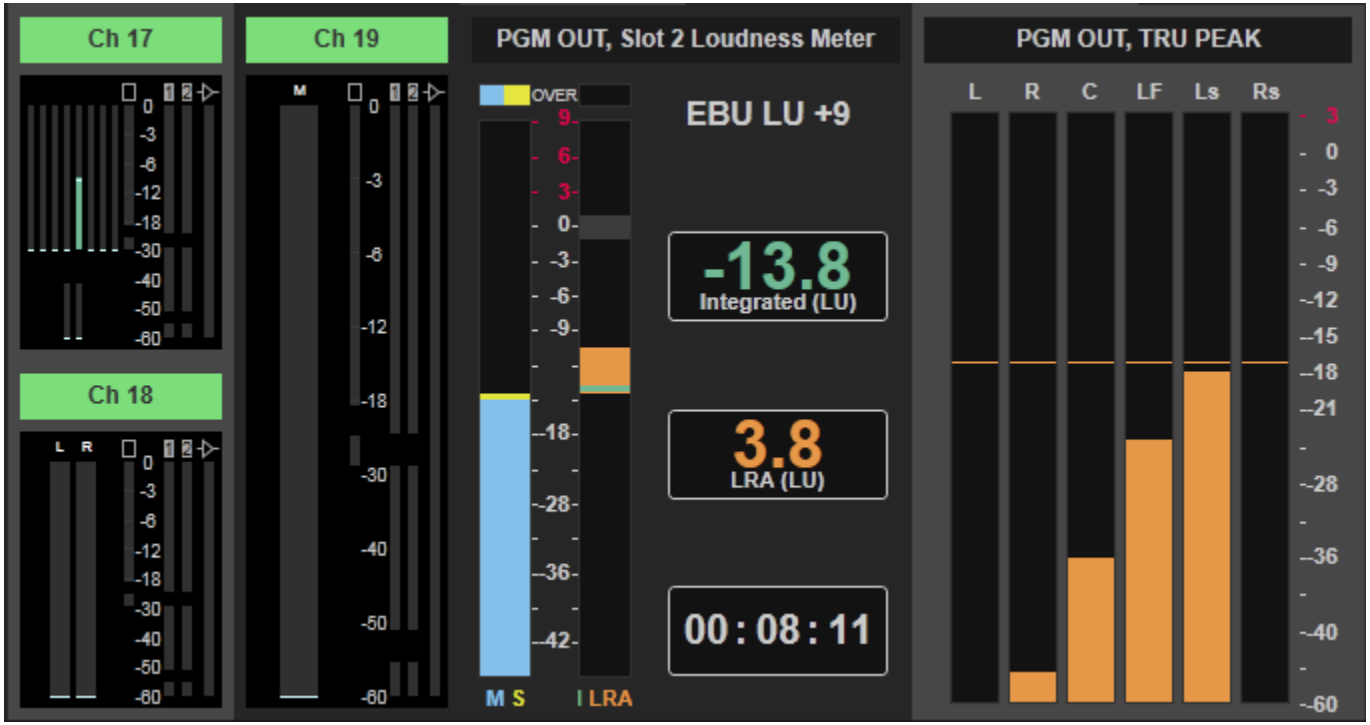
Clear Query (on User Key)

Clear Query is now an assignable option for user keys. This allows one of the user keys to become a permanent Clear Query function to aid operation when using Query to Focus Fader. Clear Query is can be assigned to a user key in the **Setup | Options | User** page, it is listed under Console Functions.

External Monitor Selector as a Routable Source

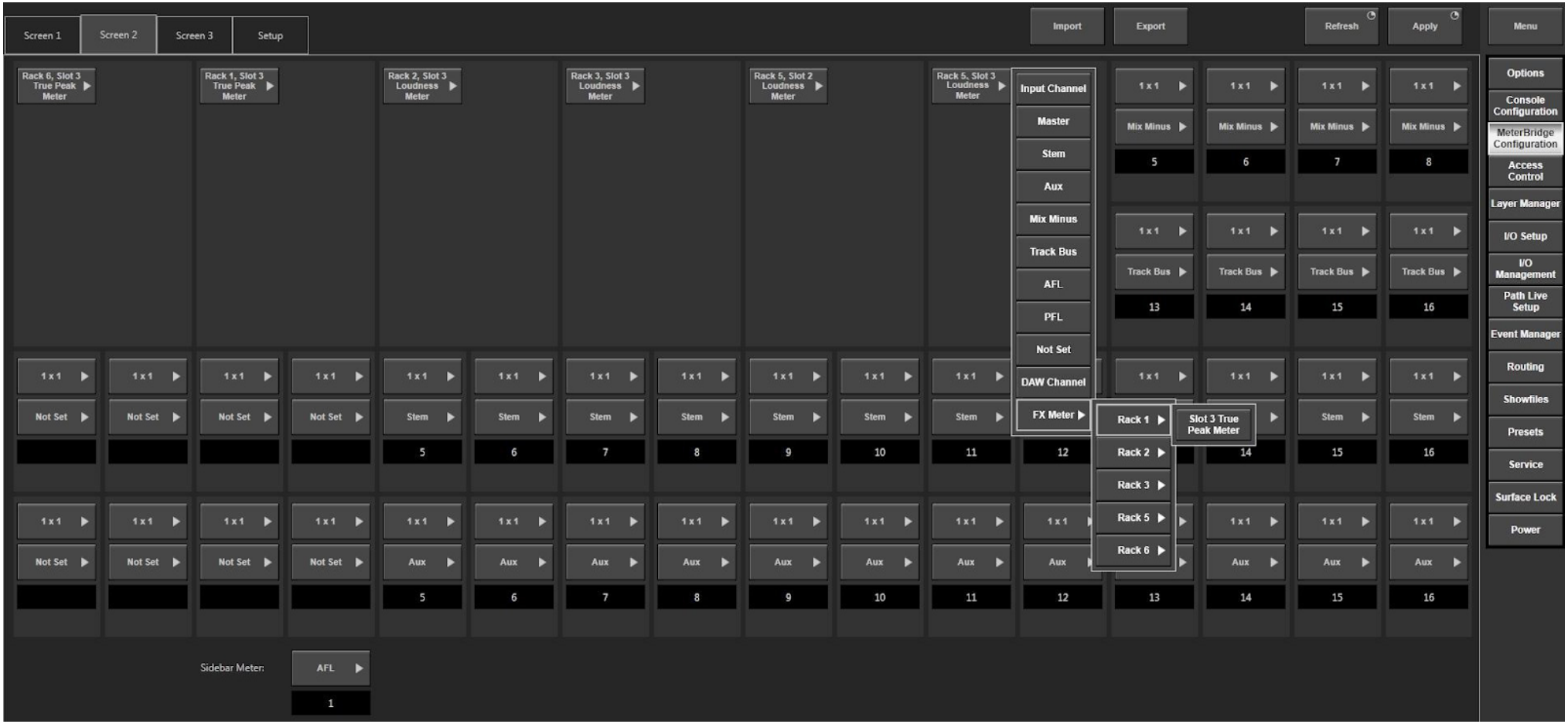
Both active external monitor inputs are available as a routable source, allowing the external monitor inputs to be used as source selectors for other destinations, for example external or FX rack metering.

Effect View on Meterbridge (S500 Only)



Loudness and True Peak FX rack meters can be added to the S500 meterbridge. System T's FX rack provides loudness and true peak metering without compromising channel or bus processing. The configurable meterbridge option allows you to present dedicated specialist metering for the paths and signals that need analysis, viewable at all times. The FX rack slots are routable from any path or signal on the AoIP network, making it possible to meter all servers, remote input feeds, different formatted PGM outputs, internal console stem groups or input channels. This selection is saved within the showfile and recalled when loaded.

To add FX rack meters to the meterbridge construct a 2x2[1] slot in Meterbridge Configuration, choose FX Meter from the source drop down and then select an FX slot from the list of FX racks. Only those with compatible FX types will be shown for selection. Changing the name of the FX rack slot will propagate the name to the meterbridge.



[1] To construct a 2x2 slot all slot positions that will be used must be set to 1x1. i.e. the slots immediately below and to the right must all be 1x1

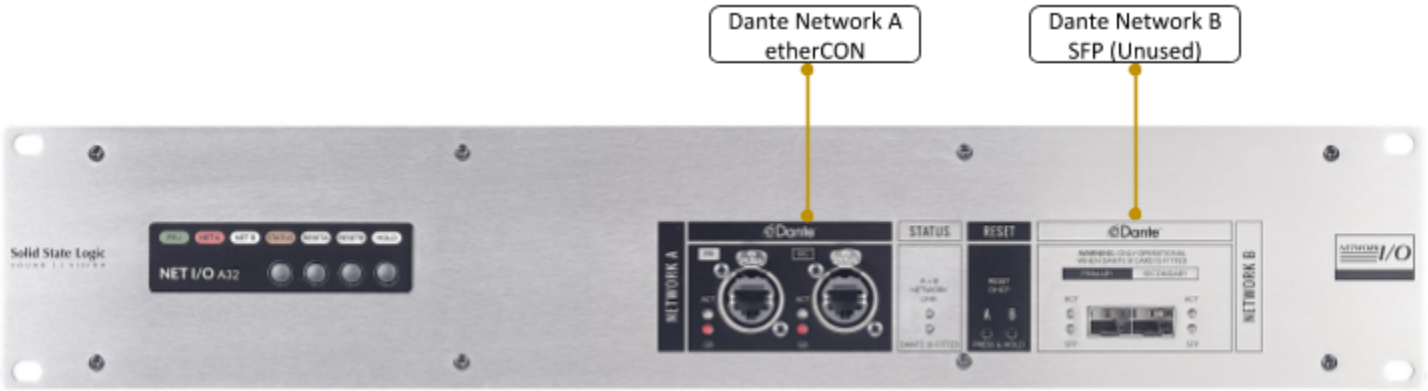
A32 and D64 Support

V2.0 introduces support for two new Network I/O devices to further compliment the range of existing devices. A32 is a 32-input and 32-output Dante I/O device featuring 32 SuperAnalogue™ line inputs and 32 SuperAnalogue line outputs. D64 is a 64-input and 64-output Dante I/O device featuring 32 AES3 inputs and 32 AES3 outputs. All analogue and AES audio connections are 25-pin D-type.

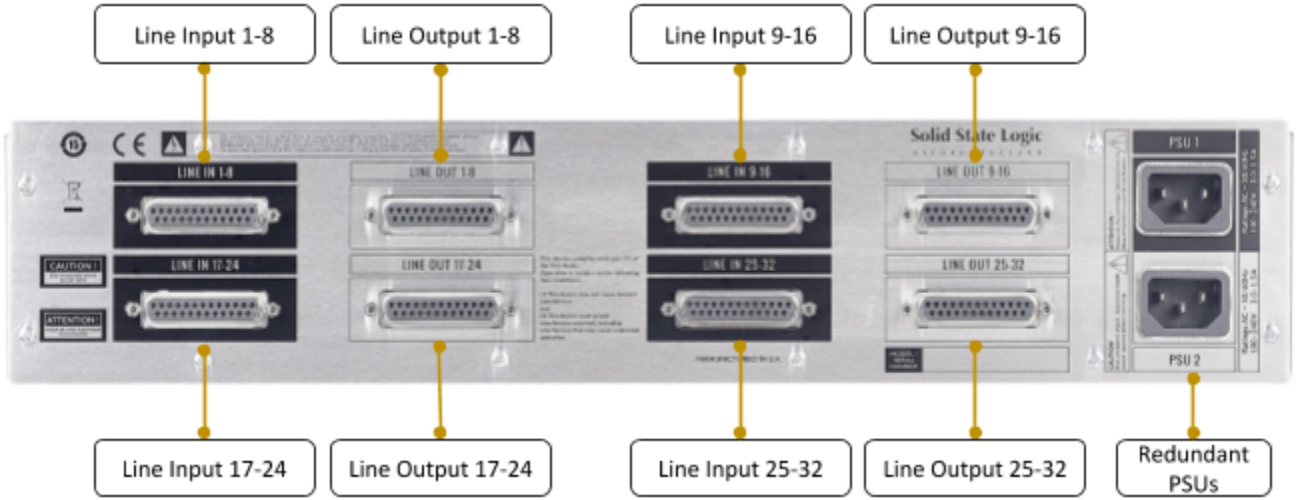
Both A32 and D64 can be controlled remotely from SSL System T and SSL Network I/O Controller app for PC. These units are ideally suited for bulk analogue and AES I/O connections from control or machine rooms, featuring a high-density combination of analogue or digital inputs and outputs, redundant power and network connections. A32 and D64 have two redundant sets of network connections. The Network A ports feature etherCON ruggedised RJ45 connectors. The Network B ports are SFP cages, which can be fitted with either RJ45, single-mode or multi-mode LC fibre connectors. This connectivity would require an additional Dante card which is not currently an available option.

Note: Network B functionality is currently not enabled.

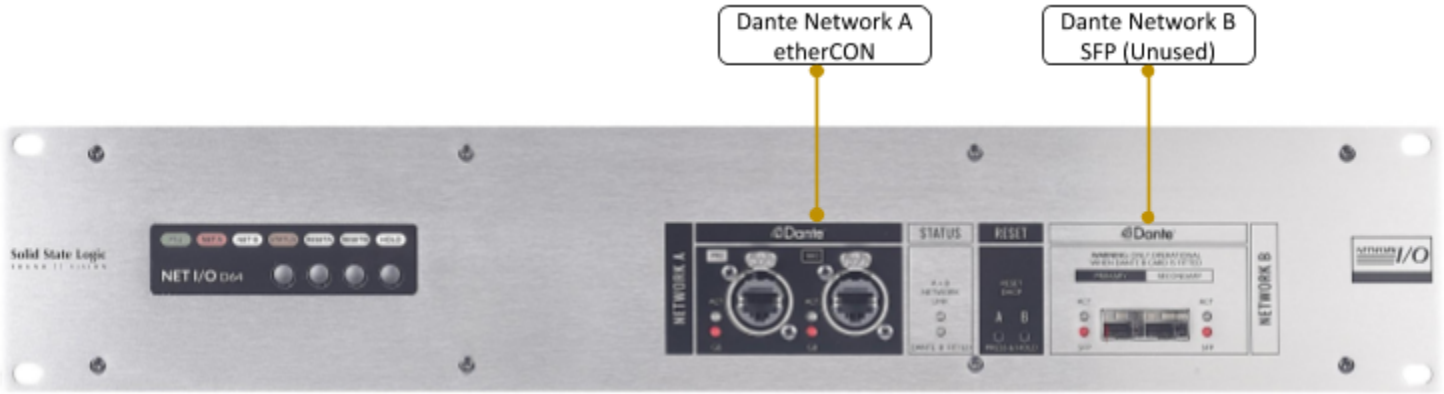
A32 Front Panel



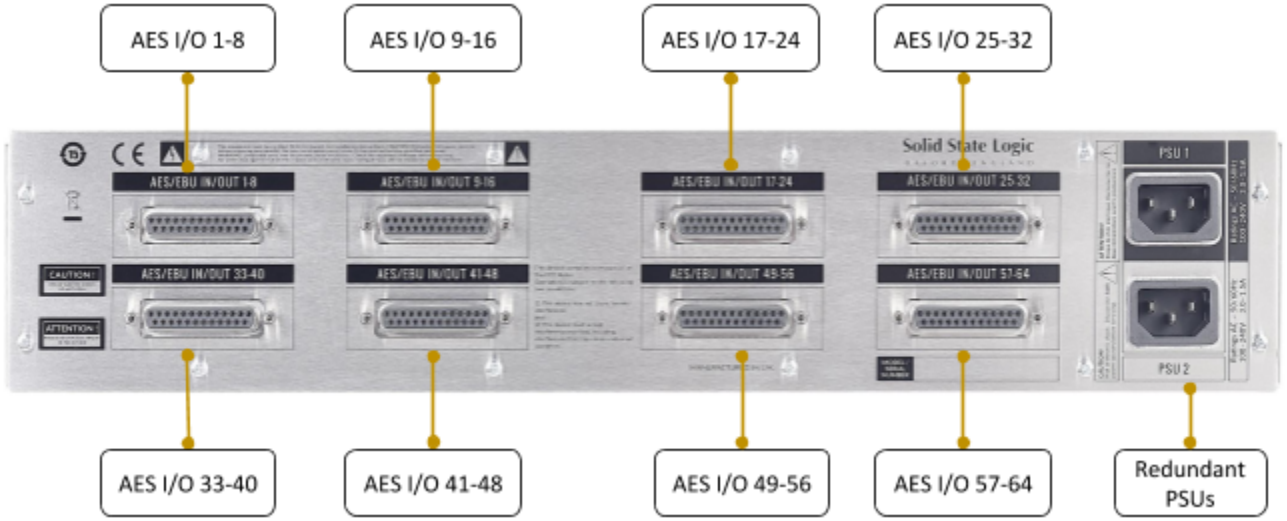
A32 Rear Panel



D64 Front Panel

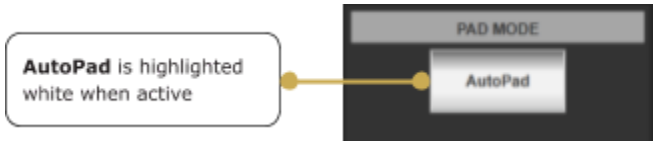


D64 Rear Panel



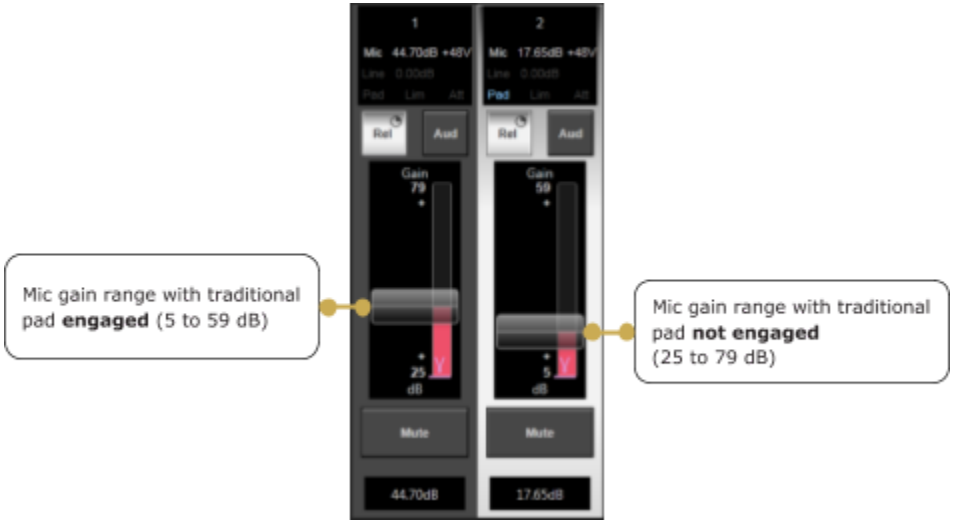
PAD Changes

The **SB i16** and **SB 8.8** stageboxes have two pad modes, **Traditional** and **AutoPad**. The **SB 32.24 and A16.D16** have **Traditional** pad only. The pad mode is selected per stagebox (applied to all inputs) from the **SETUP** tab of the stagebox within the **Setup | I/O Setup | Physical Device Configuration** page.



Traditional

Traditional pad mode is active when AutoPad is deselected. This allows the 20 dB pad to be inserted/removed manually. **Inserting the pad will now reduce the input gain by the pad attenuation (SB8.8 and SBi16 20dB, SB32.24 and A16.D16 30dB)**. The reduced value will be shown in the input channel strip and the range of available gain values will be updated to reflect the pad state. Note that maximum and minimum gain values are dependant on the Operating Level setting.



Compensated channels will change signal level in accordance with the pad setting on the associated main channel when in **traditional** pad mode. If the pad is inserted on a main channel the signal level of both the main and compensated channel will drop by the pad attenuation.

AutoPad

AutoPad provides the entire possible gain range to the operator and silently applies the pad when the gain range is set to a low value that requires the pad to achieve.

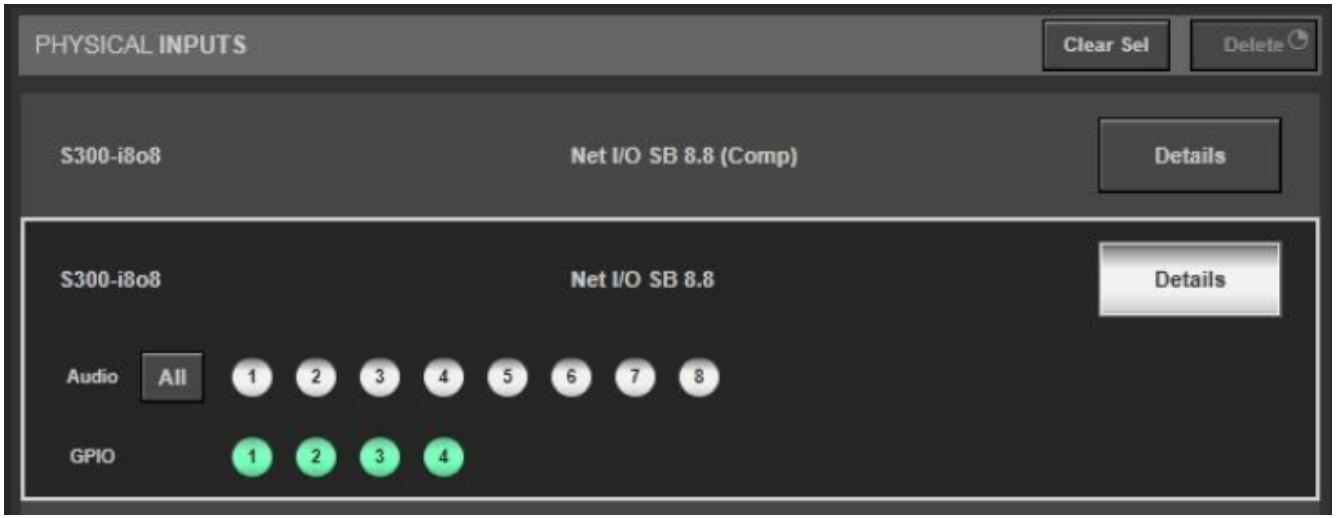
When **AutoPad** is active the **Pad** control on the channel is dimmed to show it is no longer available for user control. If the input gain is set to a low value which requires the pad to achieve then the **Pad** icon will be highlighted blue (whilst dimmed) to show that it is active.

It is advisable to check channel gain values after changing the **AutoPad** setting. Overall gain levels will be retained but pad states may change.

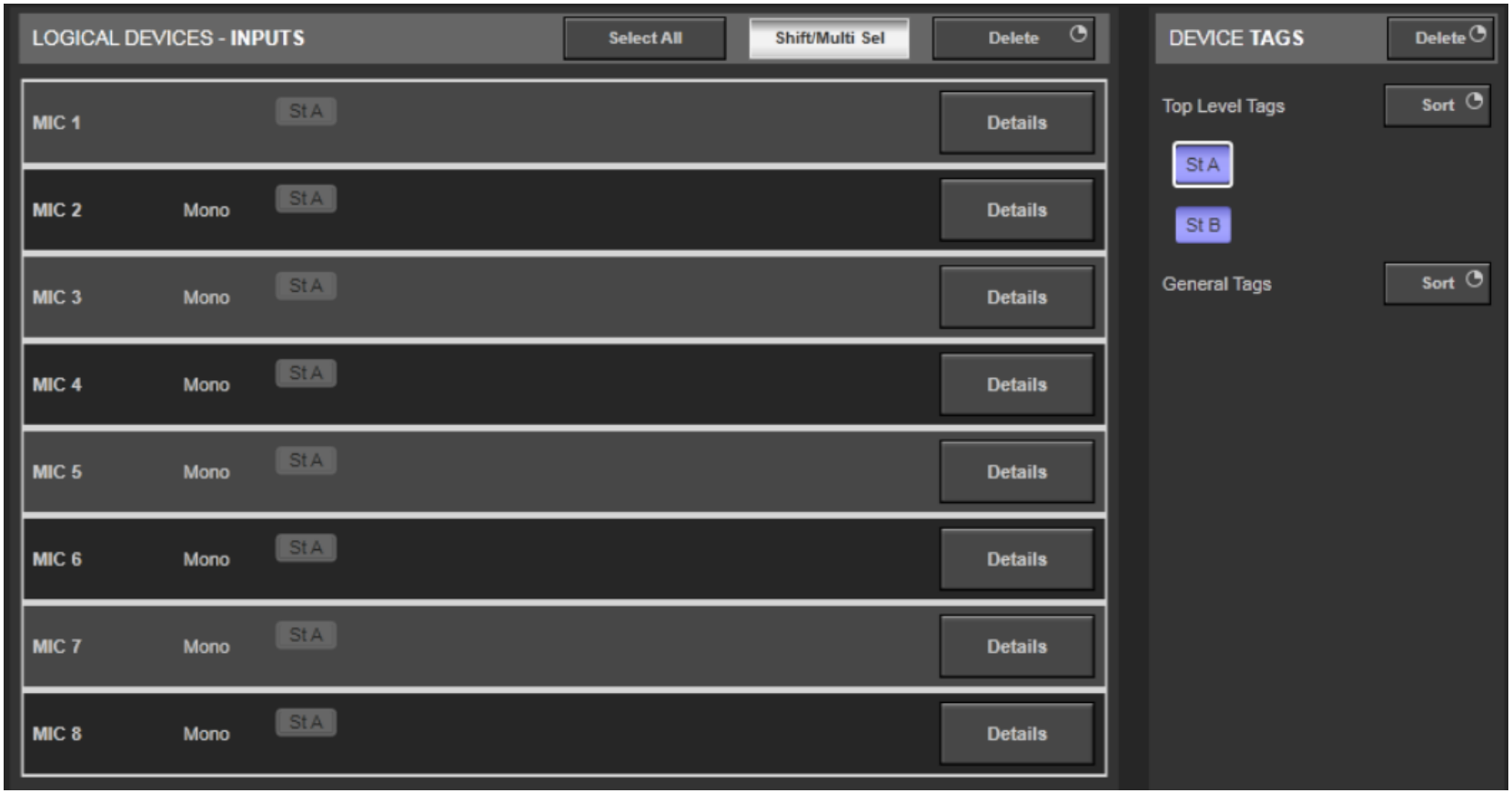
Compensated channels will retain a constant output signal level during gain changes when in **AutoPad** mode, irrespective of whether the pad has been automatically applied.

I/O Management Improvements

When selecting physical inputs for use in logical devices it is possible to quickly select all inputs or outputs for a specified physical device by using the **All** button associated with each physical device.

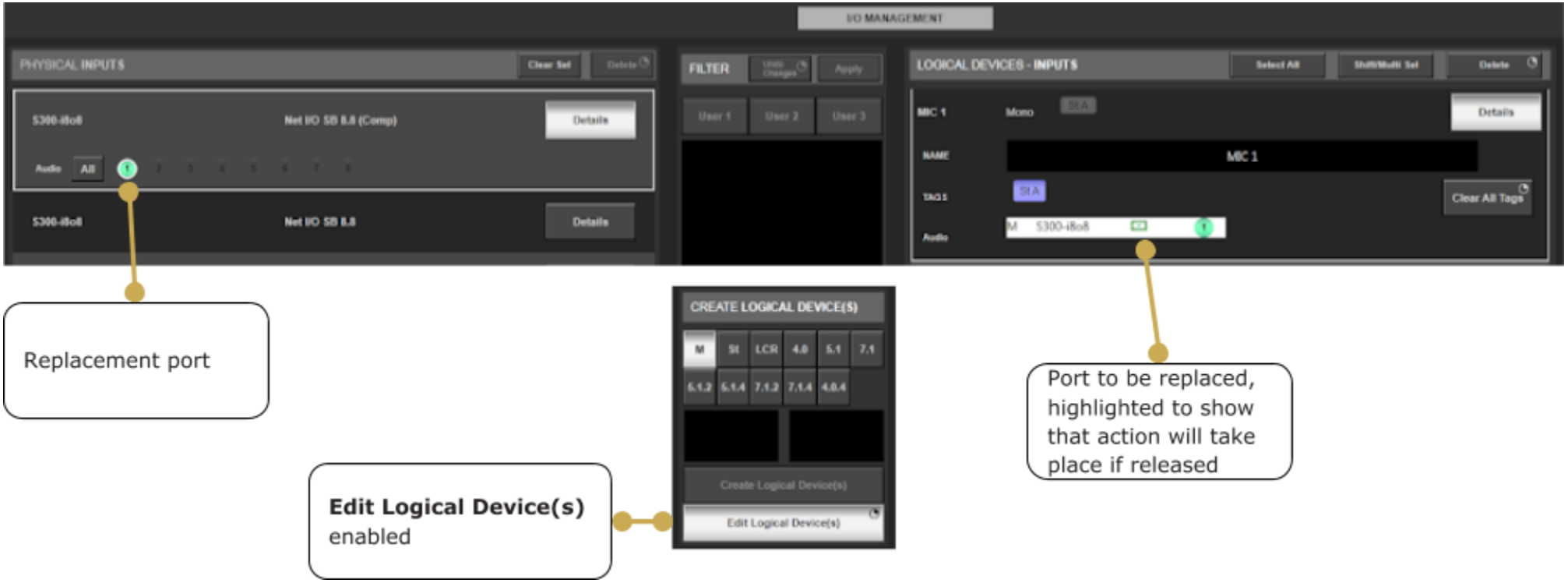


All logical devices within a filtered view can be quickly selected using the **Select All** button. When multiple devices are selected, actions performed will be applied to all selected devices. This enables the rapid creation and tagging of logical devices.



The Top Level and General Device Tags list can be reordered by dragging tags into their new desired position. The order that the Top Level tags are displayed determines the order that devices are listed in routing GUIs. Rearranging the order of Top Level tags will dynamically update the order shown in routing GUIs.

Edit Logical Device(s) allows the physical ports associated with logical devices to be changed without the device needing to be remade. Press and hold **Edit Logical Device(s)** to enable edit mode, then open the **Details** tab for the logical device to be edited. The new port can be selected from the physical device and dragged to the position of the current physical port in the logical device being edited. The associated port will be highlighted with a white box, releasing at this point will replace the associated port within the logical device.



Bug fixes and improvements

- Save user template showfiles incorrectly allowed saving over the template
- Resolved reliability issue for GPO pin 3, 6, 9 and 12 on HC Bridge
- USB connected remote fader tiles correctly respect the row and column ID
- Divergence from a 5.1 channel to a LCR bus incorrectly applied surround fold down trims twice
- Resolved an issue where loading a showfile that pushes a console into compatibility mode breaks AFL and PFL to mains until resources released and showfile loaded again

Known Bugs/Issues

- Patch routing formats that do not have the same sequential order incorrectly connected channels sequentially rather than by correct format position (e.g. LCR to 5.1 incorrectly routes R to C and C to R) manual mono patching is required (bus routing is correct)
- An Effect rack preset saved with two full stops in the name will not show in the presets browser e.g. “7.1.4 master short delay”
- An S500 console with a meterbridge cannot be a remote and have meterbridge functionality
- S300 connectivity network needs an active network connection before the console is booted - connect via a network switch rather than directly to computer

Solid State Logic

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System T

V2.0.25 Feature Release Notes

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E&OE

Document Revision History

FIRST DRAFT	Tom Knowles	4th July 2018

Contents and Navigation

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Features
- GPIO 32 Support
  - GPIO 32 Front Panel
  - GPIO 32 Rear Panel
- TCM1 Support
- MIDI in Event Manager
- MIDI in Routing
- DAW Control HUI Automation Write Enable Commands

Introduction

This document covers the features of System T V2.0.25 control software release. Update instructions for V2.0.25 are provided in a separate document.

Features

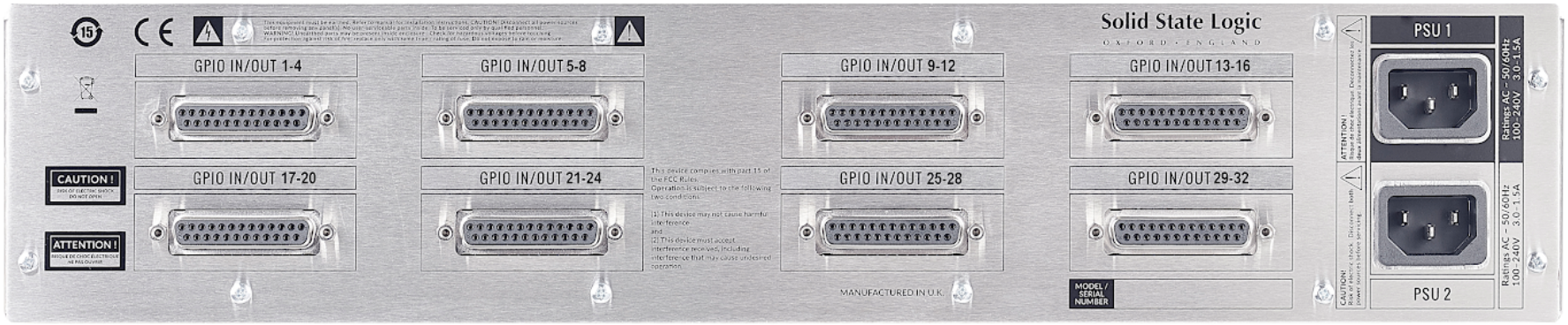
GPIO 32 Support

V2.0.25 introduces support for a GPIO Network I/O device to further compliment the range of existing devices. GPIO 32 adds bulk GPIO connections for interfacing with System T consoles and transporting GPIO across System T networks. When coupled with System T's powerful Event Manager, GPIO 32 opens up a variety of possibilities and applications for System T consoles, such as custom user key panels or complex Audio Follow Video setups.

32 GPIs and 32 GPOs are available from the 2U unit. GPIO 32 maintains the solid design and redundancy features found on the rest of the Network I/O range: redundant PSUs and redundant Dante network connections come as standard.
Note: Network B functionality is currently not enabled.

GPIO 32 Front Panel

GPIO 32 Rear Panel



TCM1 Support

TCM1 brings MIDI and LTC hardware connections to the System T, opening up the opportunity for System T consoles to be used in broadcast music production and post production studios. It also provides additional GPIO and USB connections for use with the console.

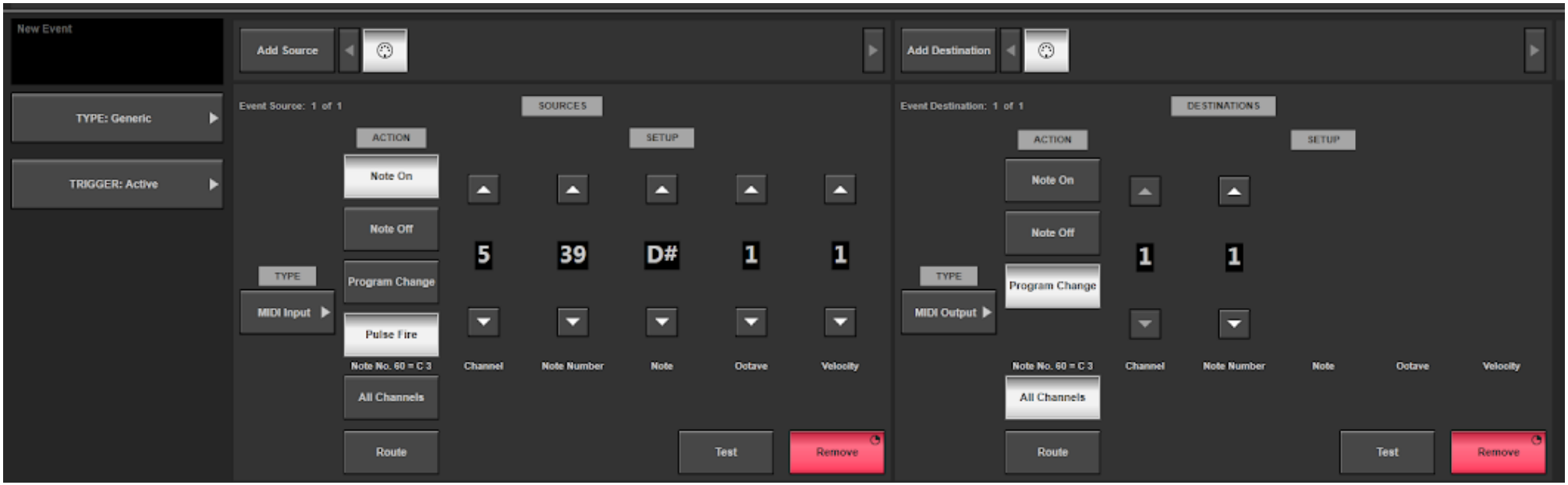
The front panel provides MIDI input, output and thru connections, LTC input and output, GPI and GPO connectors plus two USB ports. On the rear are redundant PSU connections and the USB connection to the control surface.

Please note System T does not have an internal time code generator. The LTC output is a reshaped timecode feed derived from the LTC input and the MIDI output a reclocked duplicate of incoming MTC. The MIDI output does not offer LTC to MTC conversion if the console is set to receive LTC.

MIDI in Event Manager

Event Manager now includes the option for MIDI messages as event sources and destinations. These can be associated with both TCM1 and ipMIDI ports. Note on, note off and program change messages can all be configured for use with events.

MIDI event sources have a Pulse Fire option. When enabled, on receiving the specified note on, note off or program change message a 500ms pulse will be generated and then the event source state will go low, irrespective of the input state. For program change messages this allows events to be retriggered by a repeated input. Without Pulse Fire enabled the event source state remains high following the program change.



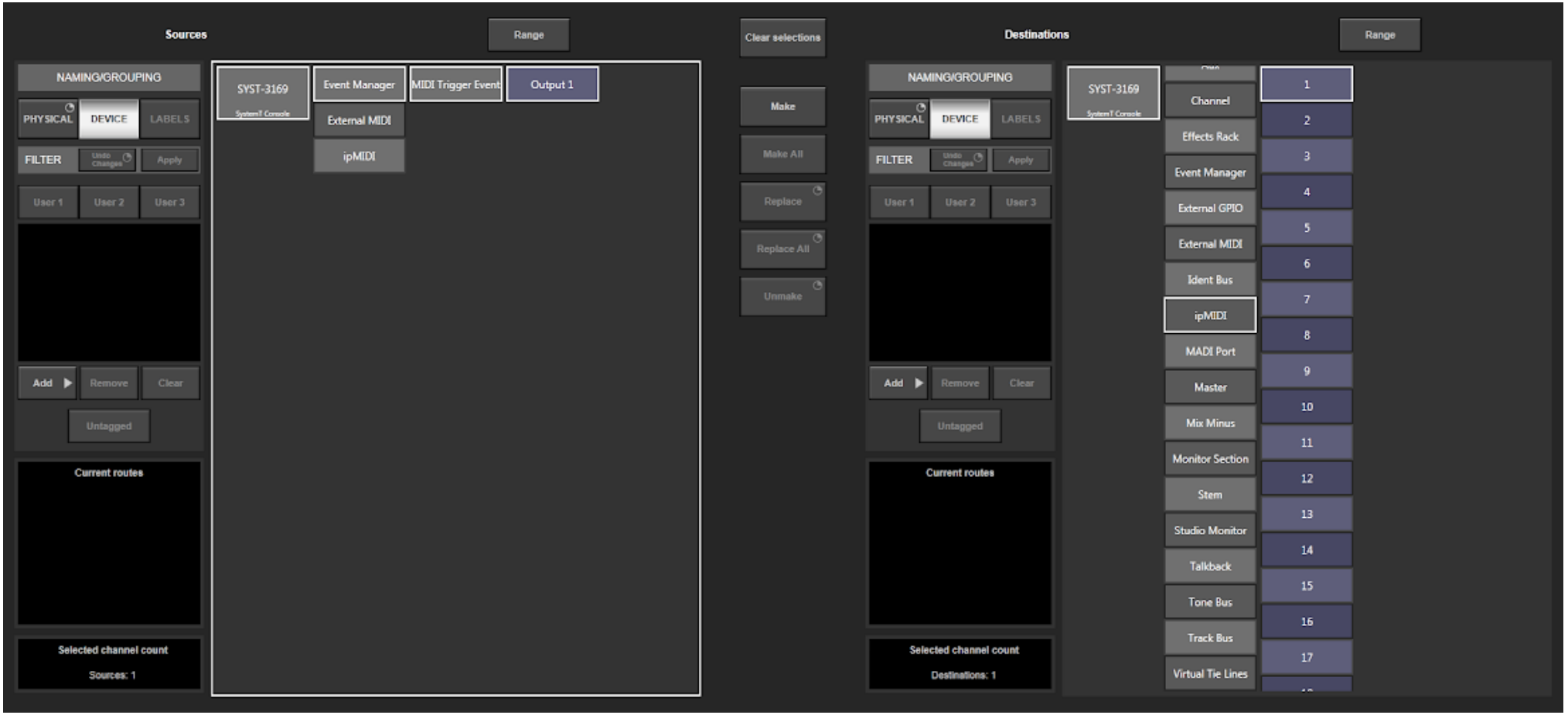
MIDI Messages as Event Source and Destination

IMPORTANT - If using MIDI in events this must use a separate ipMIDI port to the ipMIDI ports for DAW control or MTC.

MIDI in Routing

The Routing page now includes console MIDI ports. Events with MIDI sources or destinations can be routed to and from using the Routing page or within the event in Event Manager.

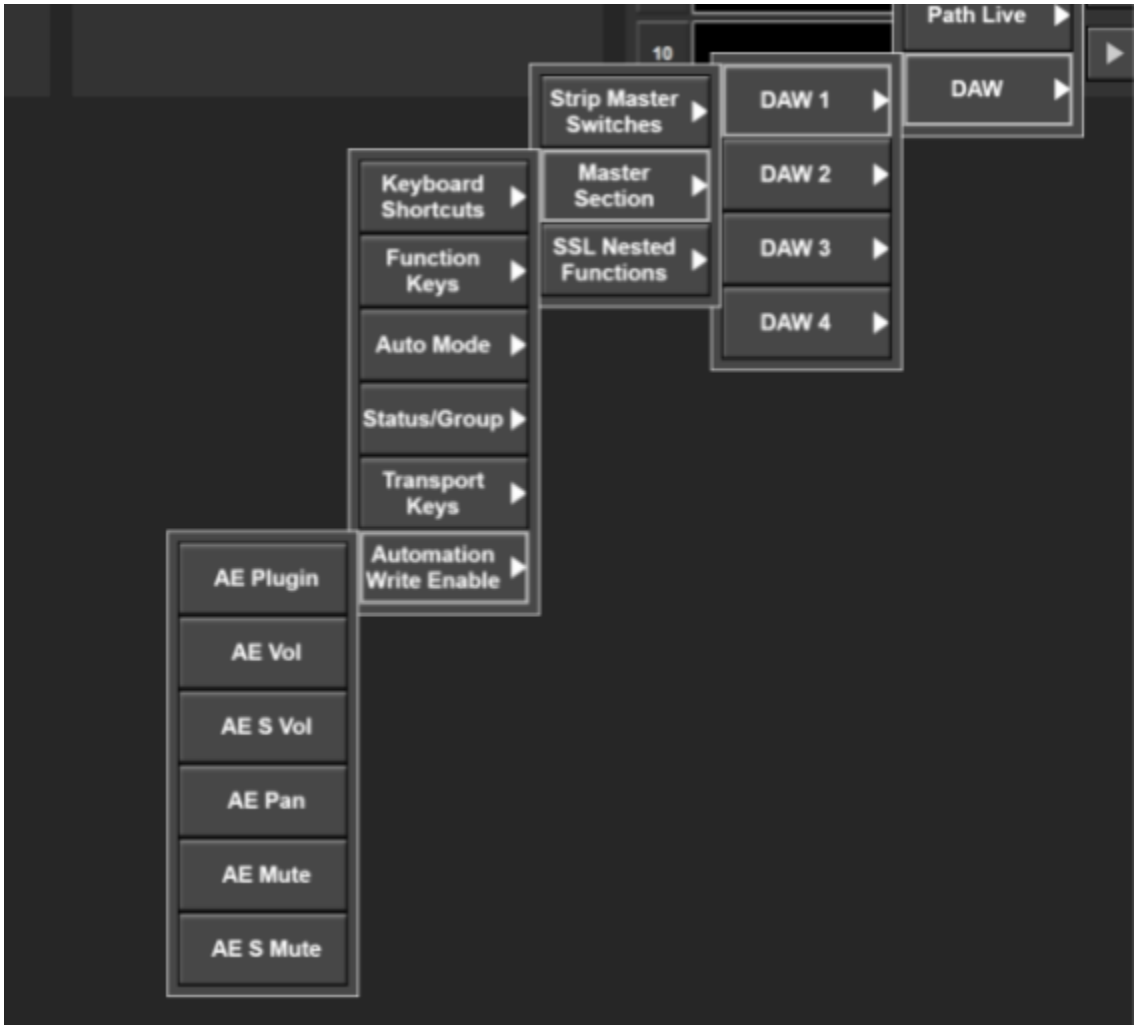
Note: TCM1 MIDI ports will only be displayed once a TCM1 has been connected to the console.



MIDI in the routing GUI allows connections between the interfaces and MIDI in Event Manager. It cannot be used to patch between MIDI I/O. For instance MIDI data coming in on ipMIDI cannot be patched to the TCM1 output and retained.

DAW Control HUI Automation Write Enable Commands

The Pro Tools Automation write enable commands can be added to user keys and the events system. In both user keys and Event Manager these functions are found in **DAW | DAW # | Master Section | Automation Write Enable**.



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System T

V2.1.17 Feature Release Notes

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Document Revision History

FIRST DRAFT	Tom Knowles	14th Jan 2019

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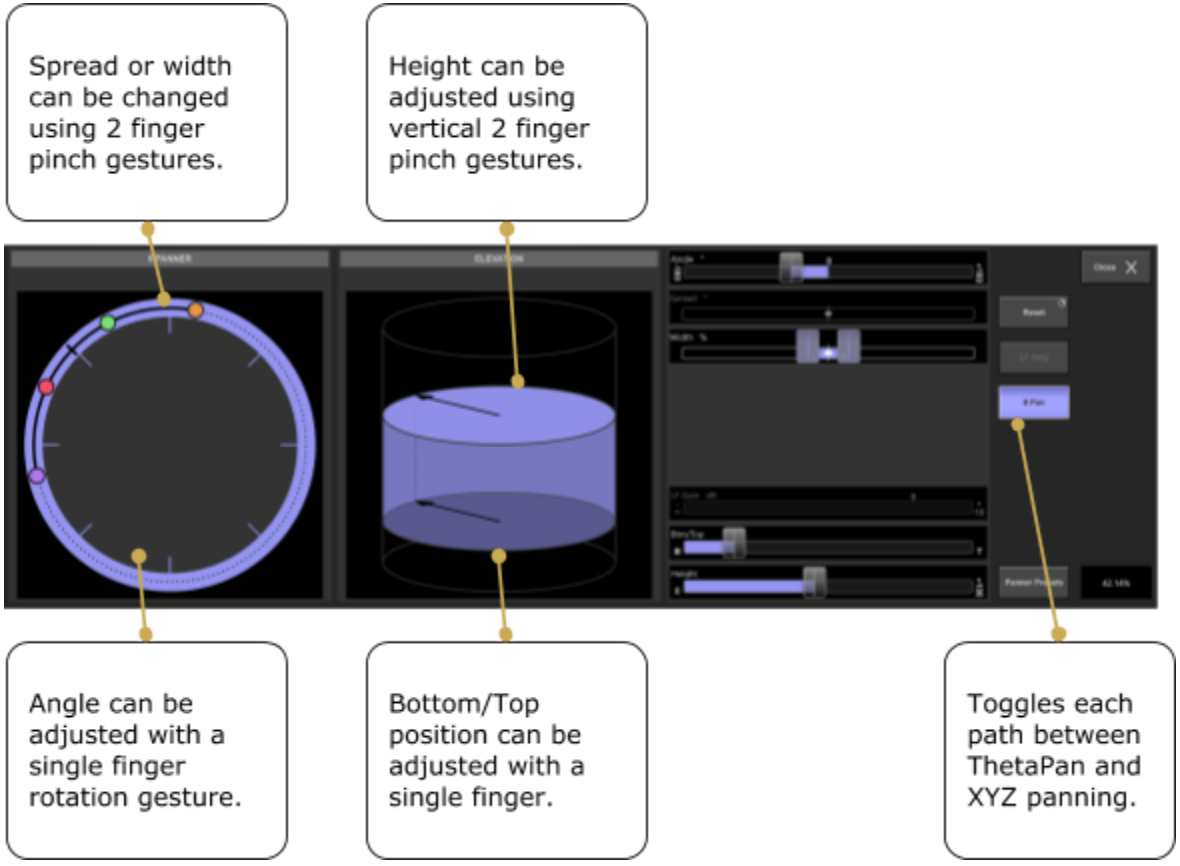
Introduction

This document covers the features of System T V2.1.17 control software release. Update instructions for V2.1.17 are provided in a separate document.

Features

ThetaPan™

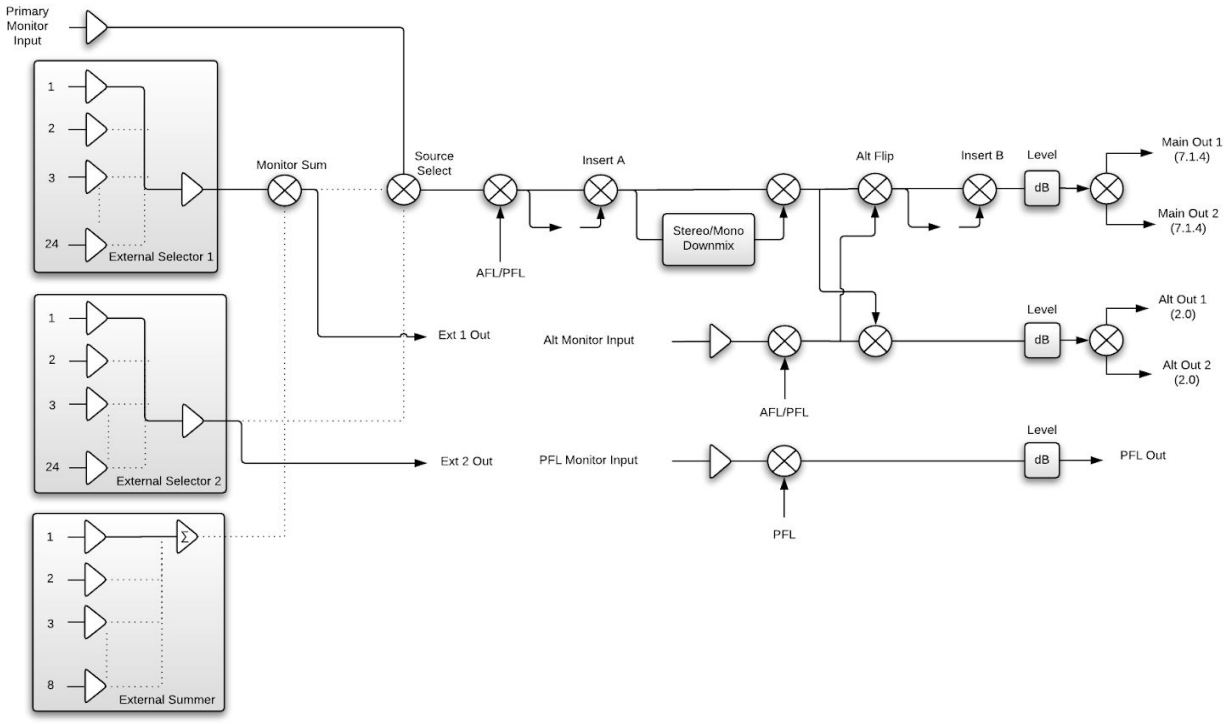
Originally conceived for 5.1 music mixing, ThetaPan™ elegantly spreads a mono point source across adjacent speakers without requiring complex multiple divergence controls. Additionally it enables signals to be passed throughout the boundaries of the soundfield in a circular motion.


Spread or width can be changed using 2 finger pinch gestures.
Height can be adjusted using vertical 2 finger pinch gestures.
Angle can be adjusted with a single finger rotation gesture.
Bottom/Top position can be adjusted with a single finger.
Toggles each path between ThetaPan and XYZ panning.

On System T ThetaPan is available as an option on all channel and bus formats with an enhanced feature set including 360° rotation and width for any 2D or 3D signal. ThetaPan™ can be used as a creative tool in drama and music production or for precise positioning of stereo ambience microphones around a stadium or arena to render a more realistic 5.1 or 3D soundscape for NGA sports or entertainment productions.

External Monitor Source Summing

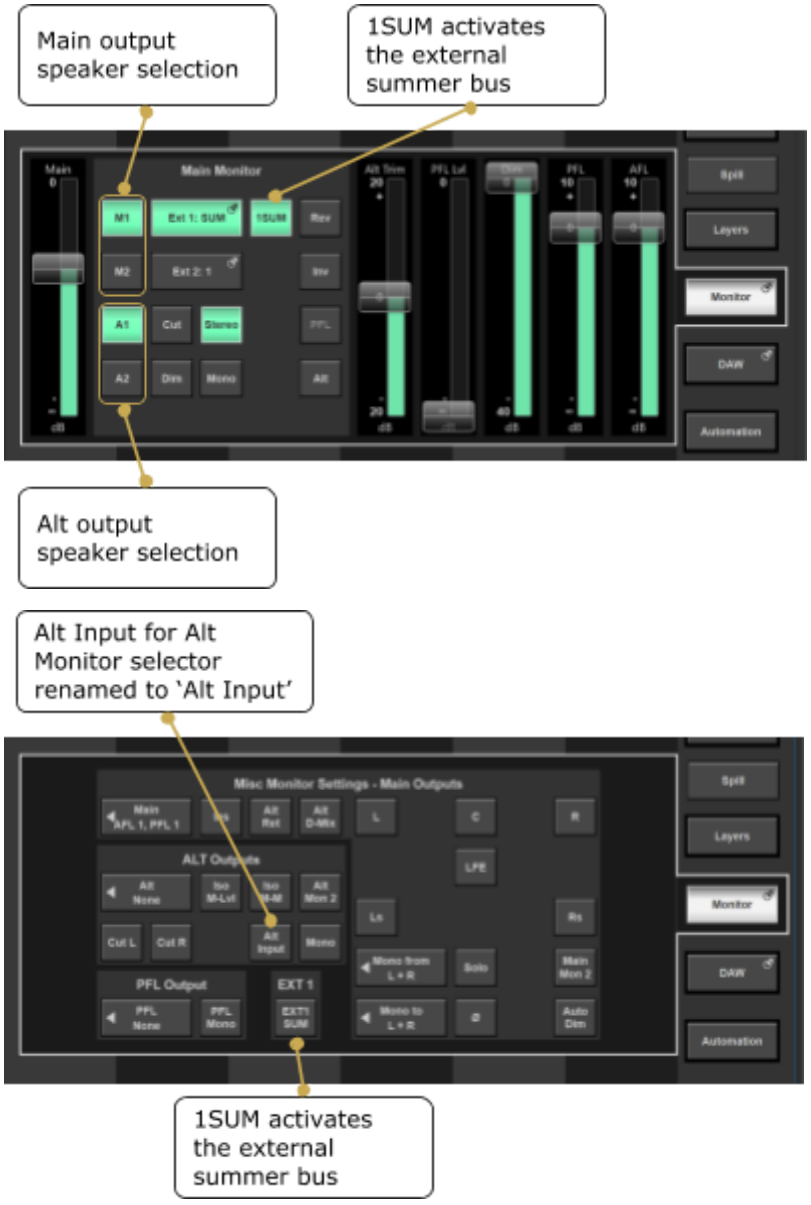
External 1 now includes the option to sum up to 8 external sources. This is available in the Monitor 1 section in both Single and Dual User mode.



When enabled, “1Sum” replaces the output of External Selector 1 with the output of an external summer bus. The summed inputs share the same source routing as External Selector 1. Active source selection for Ext1 and 1Sum are independent, allowing the 1Sum button to be a toggle between monitoring the Ext1 sum bus and a specific Ext1 source, essential when mixing to multiple stems rather than an overall mix bus.

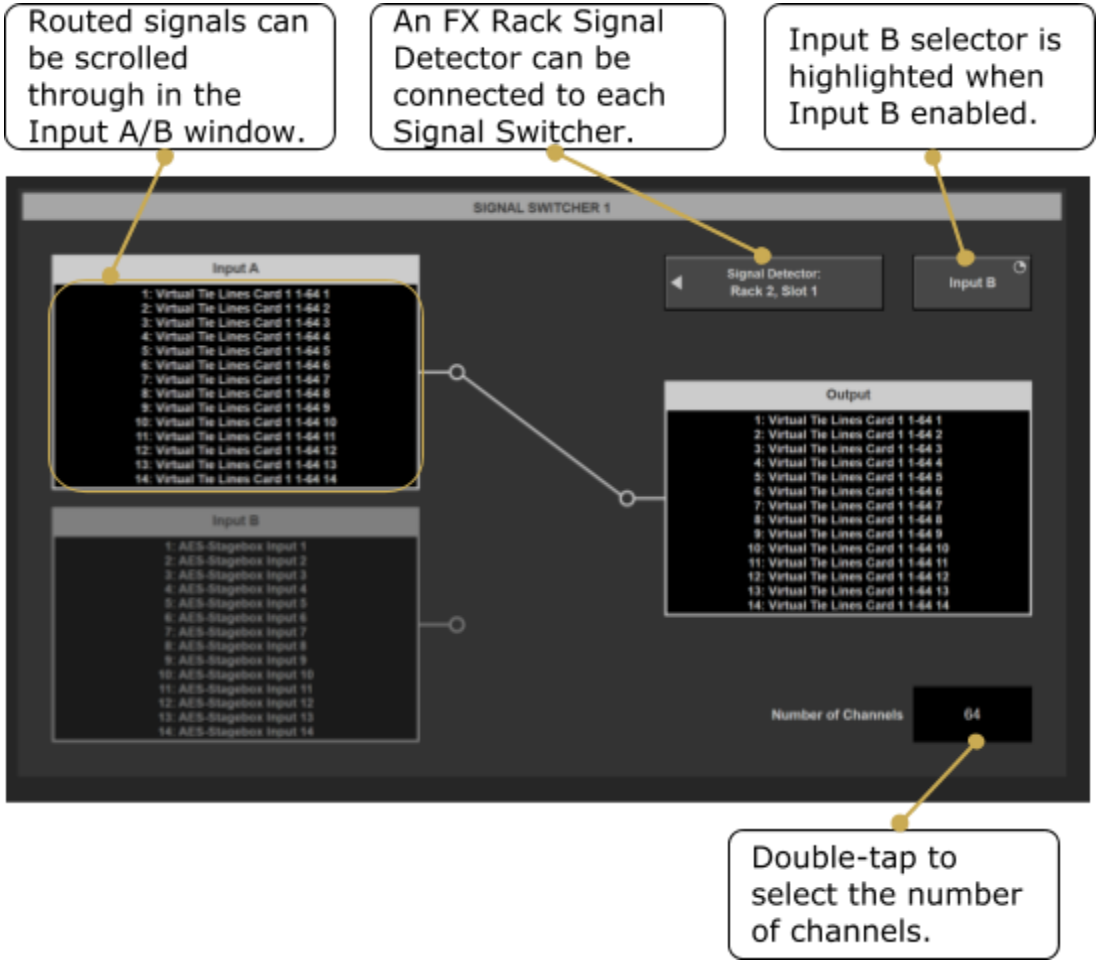
1Sum can be assigned to an event for control via user keys or GPIOs, and the button appears in both the Main and Misc monitor popouts. The Ext1 sum bus source selectors are also available in events or as user keys.

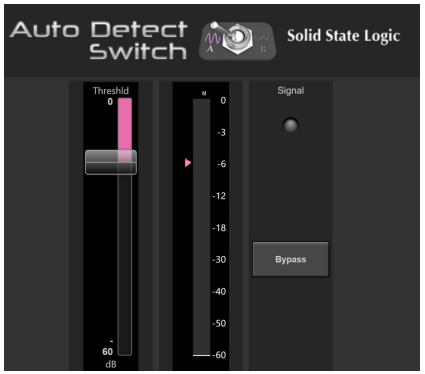
The Main monitor popout includes additional speaker selection buttons: Main Out 1 (M1), Main Out 2 (M2), Alt Out 1 (A1) and Alt Out 2 (A2). The Misc monitor popout benefits from updated headings.


Main output speaker selection
1SUM activates the external summer bus
Alt output speaker selection
Alt Input for Alt Monitor selector renamed to 'Alt Input'
1SUM activates the external summer bus

Signal Switchers

Four sets of multichannel A/B input switchers are provided to allow rapid switching between two sets of inputs, accessed from a dedicated page in the Setup menu. Routing to and from the Signal Switchers is achieved through the Routing page. Each signal switcher supports 1 to 64 channels of audio, ideally suited for switching between main and backup playback machines. The switches can be triggered manually from the GUI, via GPIOs in Event Manager or assigned to user keys.


Routed signals can be scrolled through in the Input A/B window.
An FX Rack Signal Detector can be connected to each Signal Switcher.
Input B selector is highlighted when Input B enabled.
SIGNAL SWITCHER 1
Input A
Signal Detector: Rack 2, Slot 1
Input B
Output
Input B
Number of Channels
64
Double-tap to select the number of channels.

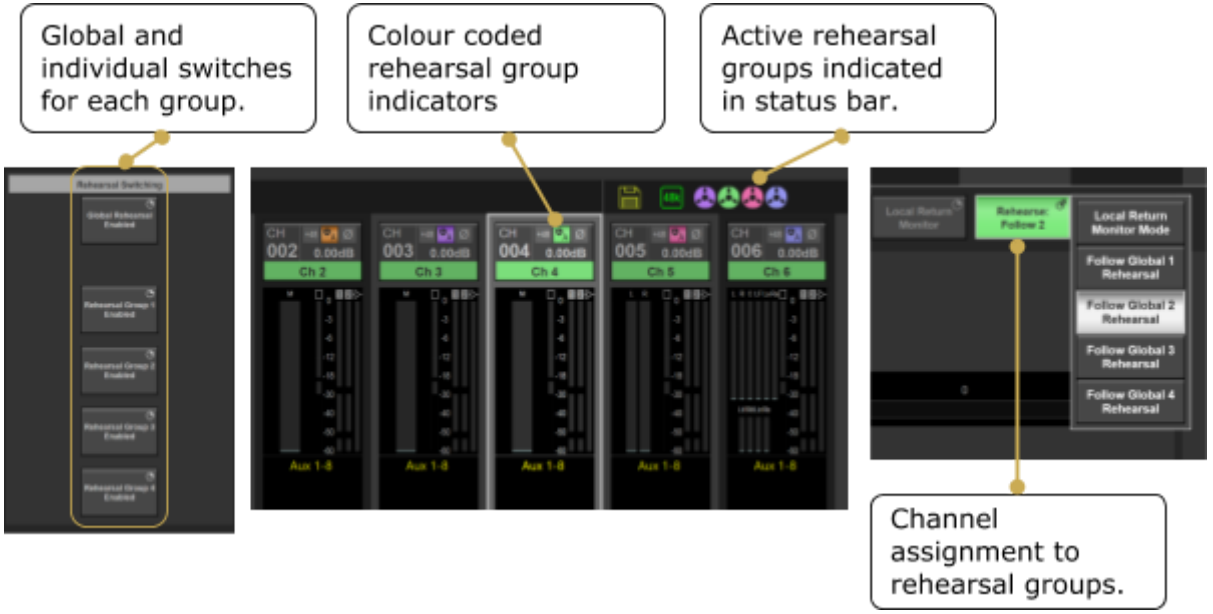


Additionally the new FX rack Signal Detector can provide automatic switching when a signal falls below a particular level. The auto detect switch is swap to B only, and happens when the signal falls below the set threshold. Once triggered, the user must manually switch back to input A if required. This feature prevents the switcher toggling backwards and forwards if the control signal is continually crossing the set threshold. It is advised that a dedicated control signal be provided from the primary playback machine to manage this switching, rather than relying on content not having periods of silence.

Note: This feature is not for use with Mic inputs that require control from the input channel. It will NOT pass control data across the switcher. Mic input control is only ever assigned to the channel via a dual domain route from the stagebox to the channel path. Similarly, Path Live source tags will not pass through a signal switcher.

Enhanced Rehearsal Switching (4 Groups)

Rehearsal monitor switching control is divided into 4 groups, and each group can be toggled independently or globally switched. The groups can be switched manually from the GUI, via GPIOs in Event Manager or assigned to user keys. Complex multi act entertainment and music shows can all be managed directly from System T. The rehearsal group indicators in the status bar plus channel and stem indication are colour coded for each group.

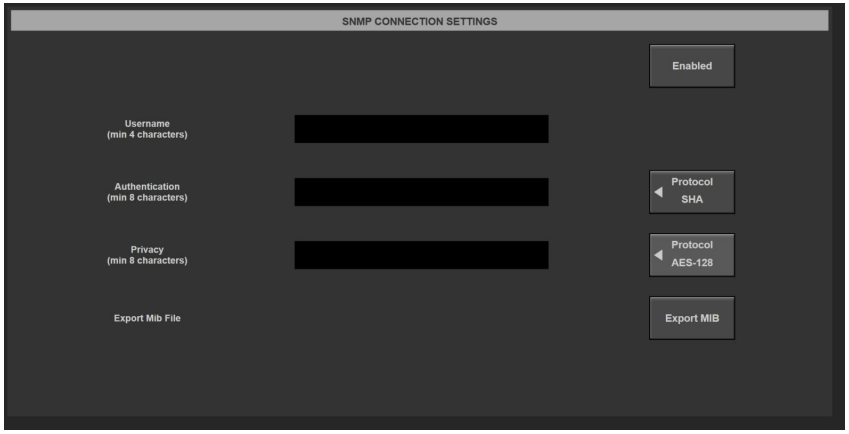

Global and individual switches for each group.
Colour coded rehearsal group indicators
Active rehearsal groups indicated in status bar.
Local Return Monitor Mode
Follow Global 1 Rehearsal
Follow Global 2 Rehearsal
Follow Global 3 Rehearsal
Follow Global 4 Rehearsal
Channel assignment to rehearsal groups.

Local return switching per channel or stem is retained, plus the Channel Detail view user interface has been improved by separating the local switching and control mode into two seperate buttons.

Note: Showfiles from pre V2.1 are compatible, but 'rehearsal group follow global' configuration will have been removed and need remaking. All channels and stems previously set to be globally switched should be added to one of the new global groups. User key and event assignment for rehearsal switching will also need to be reconfigured.

SNMP Support

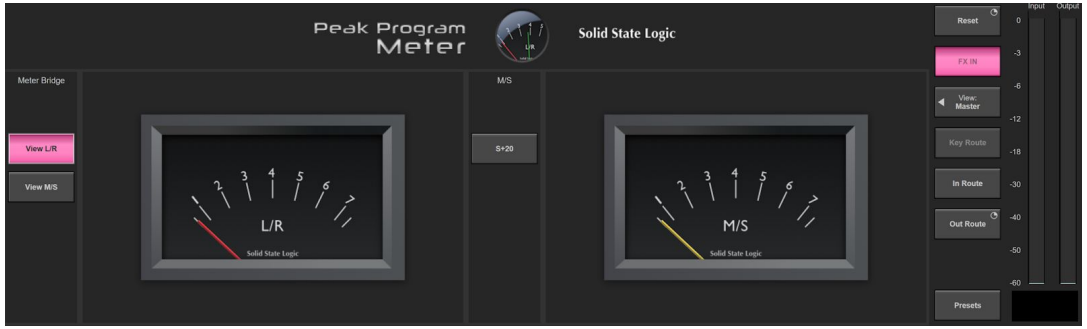
SNMP is included using SNMPv3. Initially this covers Surface and Tempest Engine PSU status' plus Dante, OCP, Connectivity and Studio Integration NIC status'. This information can be requested by an SNMP server from the main System T control surface or TCR using the SNMP get command. The MIB file can be exported from the console GUI to a USB device.



Further details on how to configure and use SNMP are available in an application note (STAN 015) via the SSL Tech Docs server, or from your local support office.

BBC PPM FX Meter

New FX rack modules which offer 'photo realistic' representations of the classic BBC 1 to 7 'PPM[1]' scale single and twin needle mechanical moving coil meters. The meter displays can be viewed in the Meter Bridge on S500 and in the small screen on S300. Both mono and stereo versions are available, with a maximum of 12 FX slots usable for PPMs.



Each division represents a 4dB increment, with PPM 4 equivalent to the BBC line up level of 0dBu in the analogue world and -18dBFS in the digital domain. Program should never exceed PPM 6, so the maximum level displayed is just +12dBu or -6dBFS (PPM7).

The twin needle versions come in two flavours: with red and green needles corresponding to stereo left and right signals or with white and yellow needles displaying the stereo sum (M) (L+R) and difference (S) (L-R). On desk main outputs normally a pair of meters is used. At other monitor points the stereo version or a mono meter can be used according to signal type. Single needle PPMs have white needles. The M/S meters have a switchable 20dB gain stage for the S signal. The M summing attenuation follows the default stereo to mono folddown setting for the entire console.

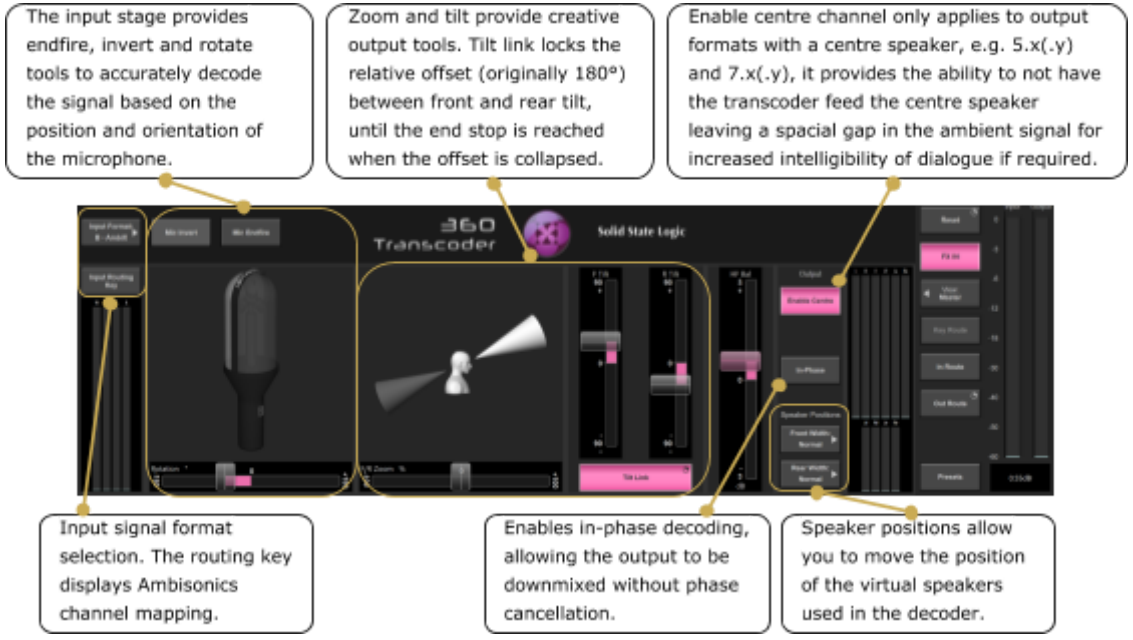
On the S300 if the FX module is used in rack 1, slot 1 the small screen in the master section will show the PPM GUI. A single meter will be shown for the mono version, vertically stacked L/R, M/S meters will be shown for the stereo version.

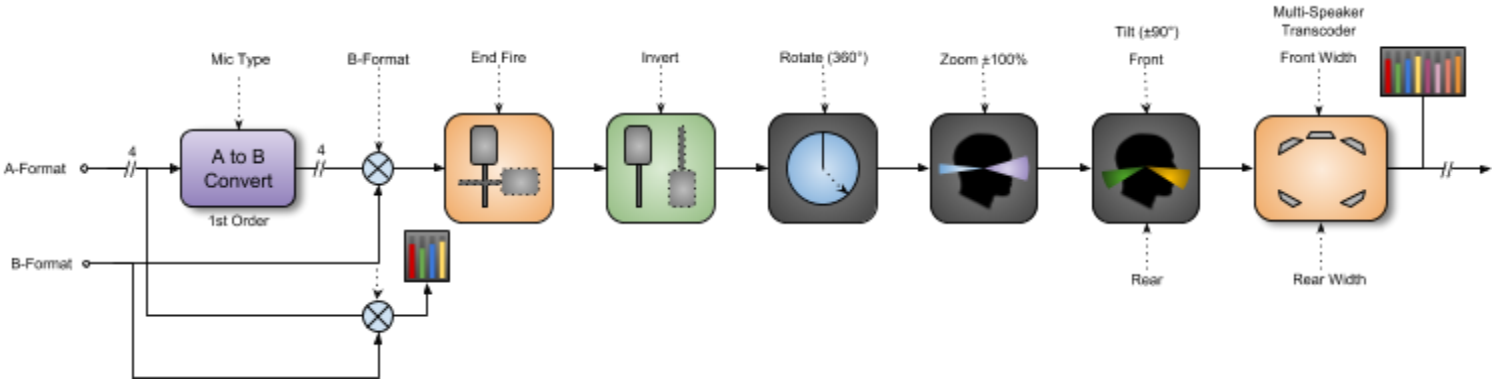
On an S500 with a meterbridge each meter can be shown in a 2x1 meterbridge slot. For the stereo version the user selects if the L/R or M/S option is shown on the meterbridge. If both L/R and M/S are needed on the meterbridge simultaneously two instances of the BBC PPM should be used. If used on a path insert the PPM meter can be shown on the S500 small screen on the channel control tile, for the stereo version L/R, M/S display selection is independant for this small screen and the meterbridge.

[1] PPM stands for Peak Program Meter.

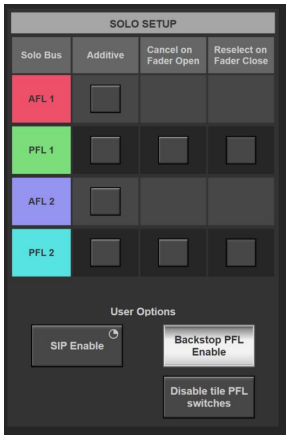
360 Transcoder FX

The 360 Transcoder opens up the possibility of using Ambisonics signals, including using A format 3D and VR microphones to provide an ambient bed for live production and the ability to use B format archived recordings where appropriate. Both FuMa and AmbiX B format inputs can be decoded, ideal for post production tasks or receiving B format directly from microphone systems. Providing a range of multichannel outputs formats, 360 Transcoder can be used to enhance productions from 4.0 to 7.1.4.


The input stage provides endfire, invert and rotate tools to accurately decode the signal based on the position and orientation of the microphone.
Zoom and tilt provide creative output tools. Tilt link locks the relative offset (originally 180°) between front and rear tilt, until the end stop is reached when the offset is collapsed.
Enable centre channel only applies to output formats with a centre speaker, e.g. 5.x(.y) and 7.x(.y), it provides the ability to not have the transcoder feed the centre speaker leaving a spacial gap in the ambient signal for increased intelligibility of dialogue if required.
360 Transcoder
Solid State Logic
Input signal format selection. The routing key displays Ambisonics channel mapping.
Enables in-phase decoding, allowing the output to be downmixed without phase cancellation.
Speaker positions allow you to move the position of the virtual speakers used in the decoder.



Disable Tile PFL



The “Disable tile PFL switches” option stops the physical PFL buttons on the fader tile from working. This setting is stored in the showfile and can be assigned to a user key to allow it to be toggled.

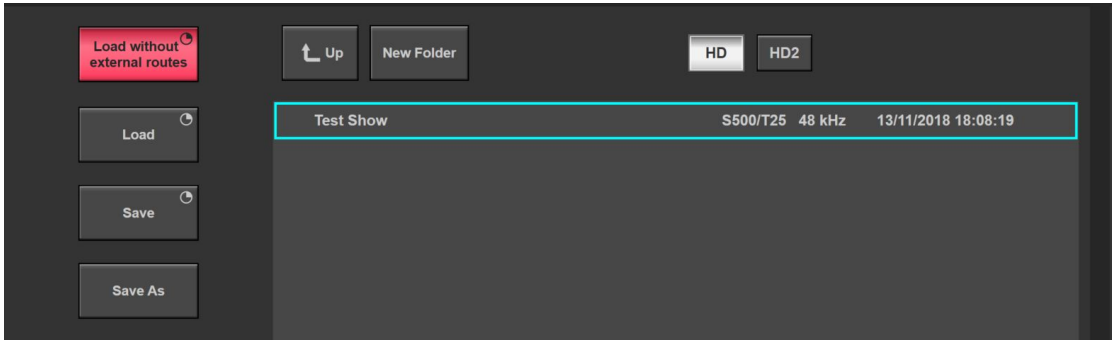
When the disable function is turned on the tile PFL buttons’ backlights will be switched off, showing the user that the switch no longer controls PFL. The tile switch will still show PFL state if enabled with the fader backstop or on-screen Channel View PFL switch.

Note: disable tile PFL only applies to the switch below the fader on both the channel and master fader tiles, it does not include PFLs around small screen or quick encoders.

Any path in PFL when the disable function is turned on would remain in PFL (unlike the backstop PFL option). The paths can be taken out of PFL using the solo clear function, or the per path on-screen PFL switch in the fader Channel Detail page.

Showfile Load Without External Route

A new showfile load option that clears the previous showfile (including routes) as normal, then loads the selected showfile without making any new Dante or VTL routes. The network side of Virtual Tie Line routes and other Dante routes not stored in showfiles (i.e. those made via an external routing system such as Dante Controller) are not affected.

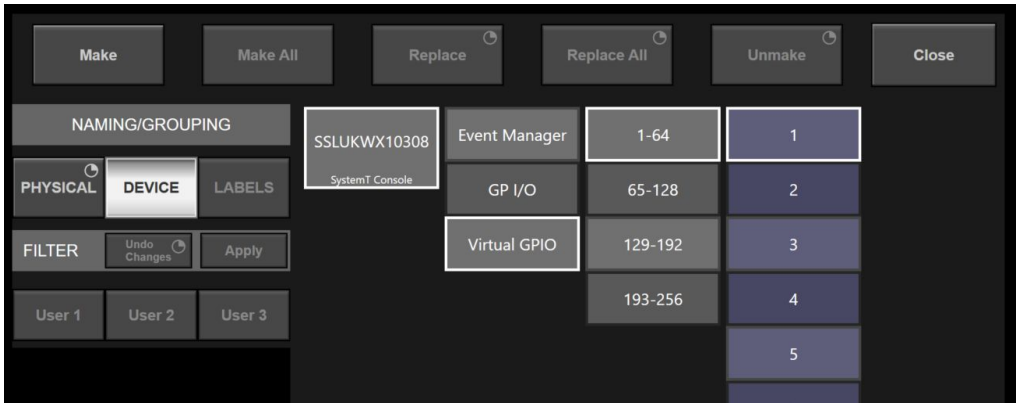


Note: When loading a showfile “without external routes” routes not loaded are lost and will not be retained when resaving the showfile, “Save As” should be used if you do not wish to overwrite the showfile. Load without external routes can be restricted from within Access Control.

Load without external routes is very useful when moving showfiles around consoles that share the same I/O network. It allows you to load the show and then make the routes appropriate for that control room without affecting operation of the other consoles.

Ember+ Virtual GPIO

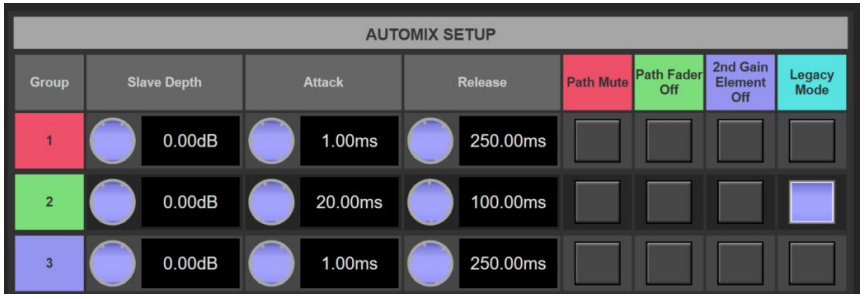
256 virtual GPIO are available in the Event Manager routing system using the Ember+ protocol. System T publishes the virtual GPIO as an Ember+ provider, an Ember+ consumer is needed to control these or to connect other Ember+ providers via these virtual GPIOs. System T uses EmberPlus version V1.7.0.



Further details on how to configure and use Ember+ vGPIO are available in an application note (STAN 016) via the SSL Tech Docs server, or from your local support office.

Automix Legacy Mode

An additional mode has been added to the System T path-based automixer. “Legacy Mode” uses an alternative signal level detection method in conjunction with an enhanced gain sharing algorithm that results in minimal attenuation of the dominant source in a typical on-air multi-mic arrangement. The choice of automix mode and parameter settings are a personal preference, SSL recommend starting with 20ms attack and 100ms release for legacy mode. The automixer in either mode can be assigned to the 2nd fader and moved around in the signal path if a post channel fader automix is preferred or pre-fader sends need to be automixed.

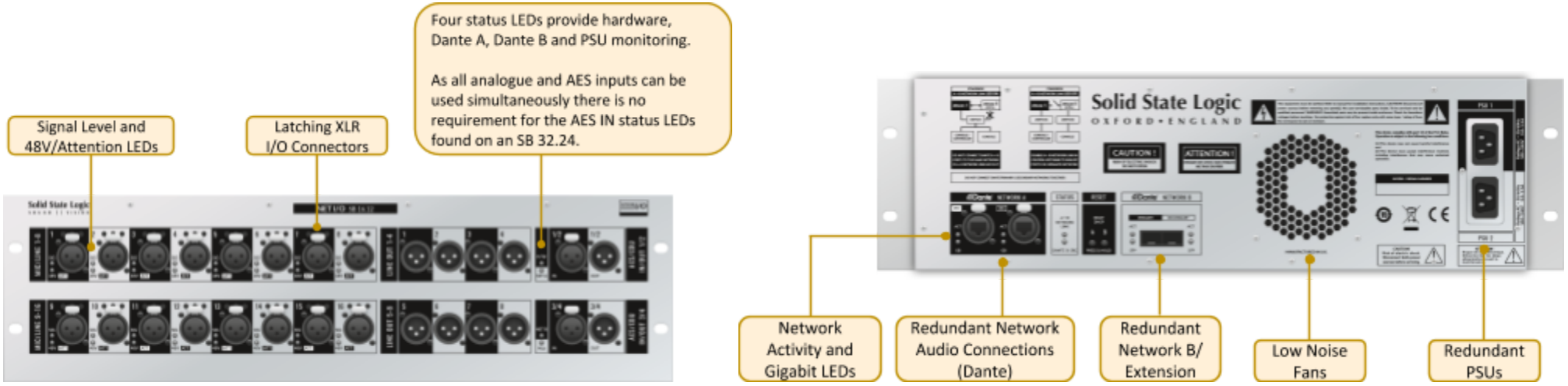


Backup/Restore System Files

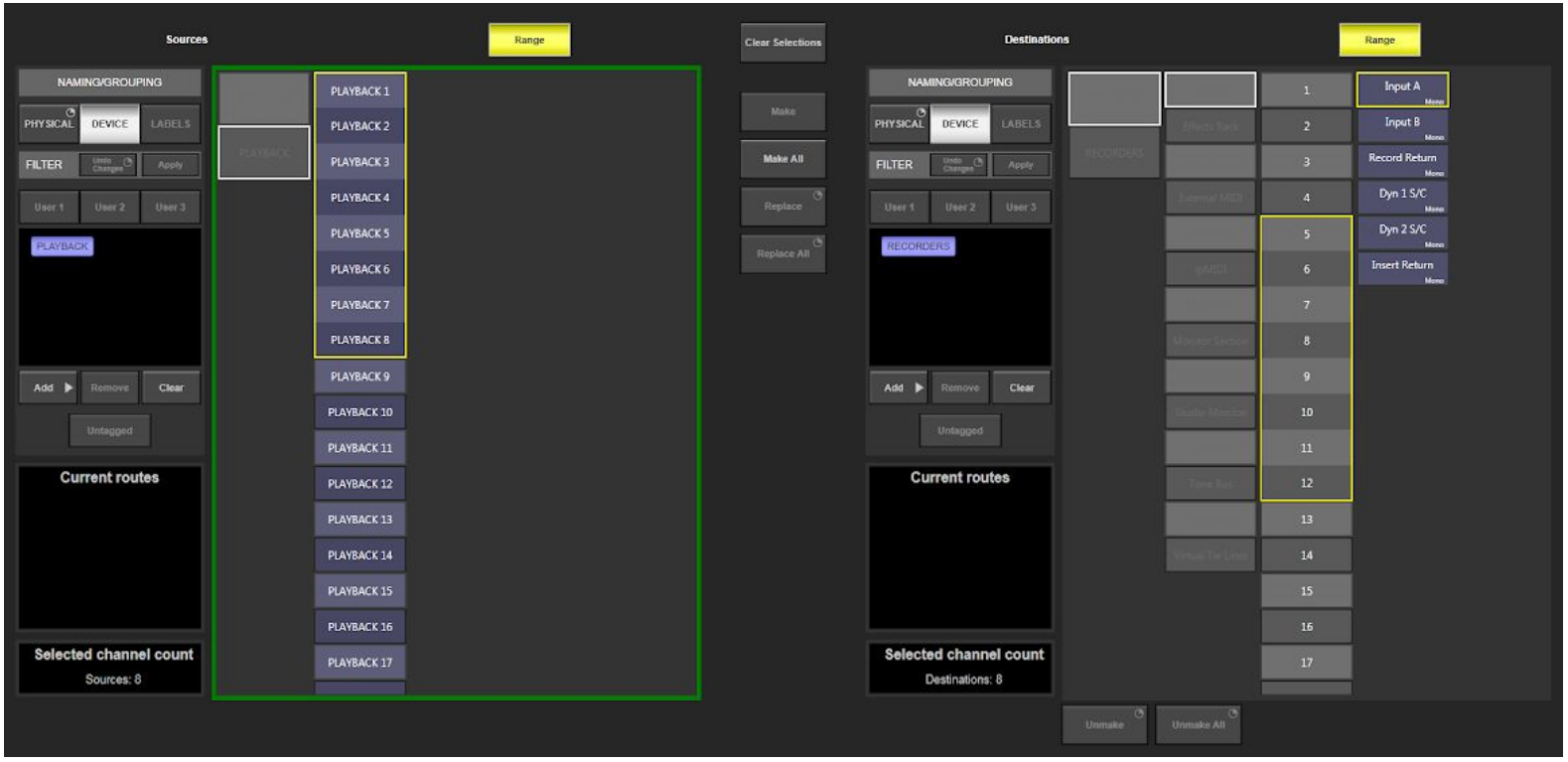
The ability to use a USB “flat install” stick to restore a backup of a console’s system configuration and user data. Further details on how use Backup/Restore are available in an application note (STAN 017) via the SSL Tech Docs server, or from your local support office.

Support for SB16.12

The Net I/O SB 16.12 is the latest model in SSL's Network I/O range. It features 16 SuperAnalogue™ mic/line inputs with gain compensated digital split outputs, 8 line outputs, 4 AES inputs with SRC and 4 AES outputs. The SB 16.12 has the same dual Dante network interfaces as the SB 32.24, providing a redundant pair of ruggedised etherCON ports for the main I/O and a redundant pair of SFP ports for the compensated split outputs. The SFP ports can be configured by the user with RJ45, multimode fibre or singlemode fibre connections. The two networks can be linked to allow access to all I/O and ports on a single (redundant) network, or split to provide network segregation for the split outputs (e.g. to feed a broadcast truck).


Four status LEDs provide hardware, Dante A, Dante B and PSU monitoring.
As all analogue and AES inputs can be used simultaneously there is no requirement for the AES IN status LEDs found on an SB 32.24.
Signal Level and 48V/Attention LEDs
Latching XLR I/O Connectors
Solid State Logic
OXFORD·ENGLAND
Network Activity and Gigabit LEDs
Redundant Network Audio Connections (Dante)
Redundant Network B/ Extension
Low Noise Fans
Redundant PSUs

Routing Additions



V2.1 includes a number of additions to the console routing, improving functionality and providing clarity of operation.

System T utilises a subject based routing method. When a source or destination is first selected in the routing GUI it becomes the subject of the routing query. The results of the routing query are shown within the outlined box (*sources are the results in the image shown*). Essentially this will filter the device list to only show matching types (audio or GPIO) and sample rates (48 or 96 kHz) that can be connected to the current routing subject. If the console is running 96 kHz and you select a 48 kHz source as the subject, the results will not include the console destinations or other I/O operating at 96 kHz.

The outline for the routing query results now changes colour depending on the state of the routing operation. This will ordinarily be green, becoming red whilst a filtering operation is taking place to indicate that the routing GUI is busy. No further filtering operations should be selected until the outline returns to green.

“Clear selection” defaults routing back to a starting point to begin a routing query. Clear selection should always be used before using the range routing feature, or when changing direction of desired routing, source to destination or destination to source.

Range routing provides the ability to make multiple routing connections simultaneously. A yellow outline shows the range selected and the specific connection point within each path where applicable. Range should be used on the subject of the routing query first. When patching to and from console paths, first select the range on the path numbers (e.g. ch 5 - 12), then select the connection point (e.g. Input A). After selecting a range within the subject, the corresponding range can be selected within the results of the routing query (e.g. Playback 1 - 8). The number of selected mono equivalent audio channels is displayed in the bottom left of each routing pane. If all of the destinations selected within the range do not currently have a connection, “make all” will be available, if any of the destinations in the current range already have a connection, “replace all” will be available.

The new “Unmake All” function allows a range of destinations to be unpatched in one operation. “Unmake” and “Unmake All” are now moved to the destination pane and act on the destination or range of destinations selected, regardless of the currently selected sources (*previously the currently connected source and therefore the entire route needed to be selected*).

Reset Network I/O Stagebox Settings

All I/O settings of Net I/O stageboxes can be reset from the console I/O Setup page. This allows stageboxes to be ‘zeroed’ ready for future use. The following settings are affected:

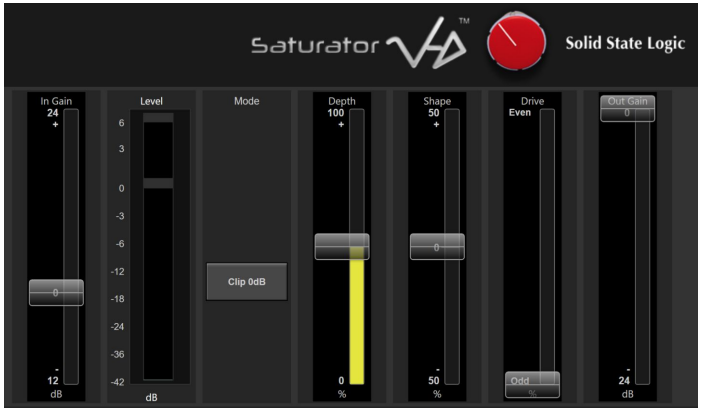
- All Ownership states will be set to unowned
- All inputs will be set to default +35 dB gain in Mic mode
- +48V and Pad parameters reset to off
- Gain compensation points reset
- AES Input Enabled buttons reset so all inputs are set to analogue (SB 32.24 only)
- AES SRC will be turned off for all inputs (if applicable)
- AutoPad and Limiter functions will be turned off (if applicable)
- GPOs will be turned off (if applicable)
- Input and Output Mute controls will be turned off

IP addresses, Network A&B Link status (if applicable), sample rate and operating level will be retained.

Other FX Rack Modules

Pitch Shifter

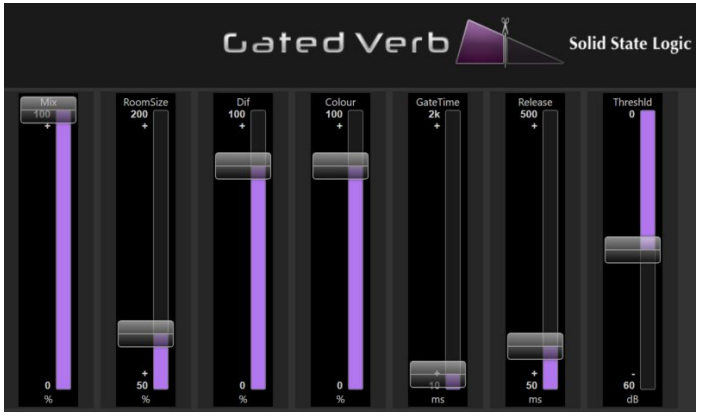
Use the Pitch controls to adjust the shift in pitch. The - semitone and + semitone buttons nudge the pitch in whole semitone increments, while the Fine slider allows finer adjustment of the pitch. Double tap the text field to the left of the semitone buttons to enter a specific pitch shift value.



VHD Saturator

The Saturator emulates analogue gain circuits. By adjusting the VHD Drive control the distortion characteristics can be shifted from '50s valve-style overdrive (Drive slider is set to even) to '70s transistor-style grit (Drive slider is set to odd).

Depth and Shape control the number of harmonics summed back into the signal, enriching the sound. Clip adds 6dB of headroom when your signal is clipping.



Gated Verb

This is a gated reverb where you can gate the tail of the decay.

Size emulates the size of the room, altering the quantity and speed of the reflections. Diffusion affects how quickly the early reflections get absorbed into the smooth reverb curve. Colour alters the harmonic colour of the reflections, to emulate the materials the sound might be bouncing off.

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Document Revision History

FIRST DRAFT	Tom Knowles	17th May 2019
FIRST RELEASE	Tom Knowles	29th May 2019
SECOND RELEASE - V2.2.14 bug fix release	Tom Knowles	

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Other Features

Introduction

This document covers the features of System T V2.2.14 control software release. Update instructions for V2.2.14 are provided in a separate document.

V2.2 sees the introduction of DAS (Dynamic Automation Software) for the System T range. Please see the separate documentation for this feature. DAS is a licensable option for your System T console, if you are interested in this functionality please speak to your SSL sales or support contact.

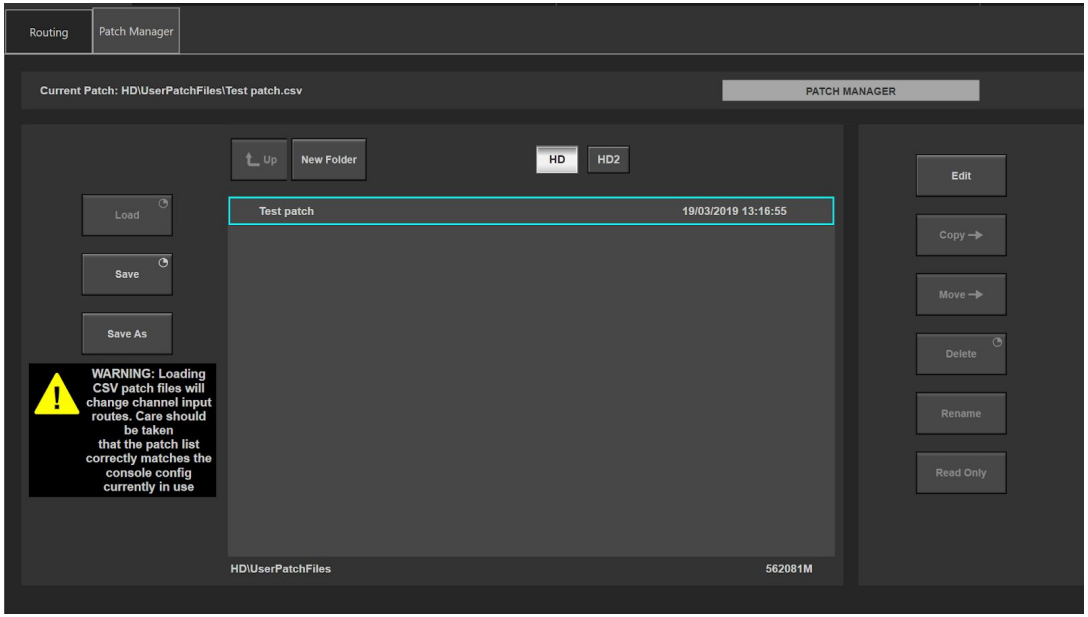
Features

Patch Manager

Patch manager allows the user to save, load and edit the channel input A routing across a console using a CSV file. Accessed in **Setup | Routing | Patch Manager**, a file browser similar to the showfile manager is available.

Patch files are saved outside of the showfile system and can be loaded into different showfiles (see note below). Patch files can be copied or moved to USB storage devices for editing away from the console in a spreadsheet editor.

This powerful feature allows input patches to be changed on a subset of channels while other channels remain routed without interruption to audio. Patch Manager will allow an operator to change an input patch, keeping the console paths and processing static as the show or festival mix evolves throughout an event. Editable offline within a spreadsheet, patch files provide a simple and familiar way to deal with last minute patch list changes at festivals or other large scale events.



Patch Save

Save As brings up the onscreen keyboard to enter a filename, to assist with patch file management this name automatically incorporates the showfile name.

Save overwrites the “current patch” file (this is shown at the top of the file browser). If no patch has been loaded the current patch is the “showfile patch” and this cannot be overwritten from the patch manager, the showfile patch is saved and recalled with the showfile.

Patch File Data

The exported patch information is organised into the following fields:

- Ch # - the channel number as defined in the Console Configuration page
- Ch Leg - the leg number of formatted channels. Blank for mono, 1 for the first (left) leg of a stereo channel, 2 for the 2nd leg etc.
- Ch Name - the user defined channel label, appended with the leg label if multichannel (L, R etc.)
- Input A Device - the name of the Dante I/O device used for the Input A route to this channel
- Input A Route - the input number on the I/O device (prefixed with AES if an AES/EBU input on a mixed signal stagebox)
- Device Type - the type of device routed to: Dante or Local[1]

A typical file will look like:

[PatchData]					
Ch #	Ch Leg	Ch Name	Input A Device	Input A Route	Device Type
1		1 Kick	i16	5	Dante
2		2 Snare	i16	6	Dante
3		3			Local
4		4	i16	8	Dante
5	1	5 L	SB32.24	AES 2	Dante
5	2	5 R			
6	1	6 L	SSL-MADIBR-MB149	1	Dante
6	2	6 R	SSL-MADIBR-MB149	2	Dante

[1] Note local routes from the patch files are not imported

Patch Load

Press and hold **Load** to load the selected patch file, this will change the input A routing for channels included in the patch file.

A **Warning** is shown on the console GUI**:** "Loading CSV patch files will change channel input routes. Care should be taken that the patch list correctly matches the console configuration currently in use."

Patch Manager relies on the console configuration matching the one that was stored within the patch file. Although it is possible to load files that do not have the same channel structure, this is not advised. When a patch is loaded it will match "channel number" and "channel leg" to the mono equivalent shown in the console configuration. If this mono equivalent does not exist in either the file or the active configuration no changes will be made to that mono leg when loading the patch. We refer to this combination of channel number and leg number as "channel ID"[2]

Note that the loaded patch is based on channel ID number. Individual routes will not be imported if:

- The channel ID exists on the console but not in the file or vice versa
- The individual channel leg does not exist for a given channel ID on the console or in the file
- The route is from anything other than Dante connected I/O ("local routes" e.g. VTLs, local MADI port, other paths, FX rack etc. are not recalled)
- The stagebox name and type defined in the file is not configured on the console
- Any of the routing fields are blank
- The console runs out of dual domain routing capacity

Editing the CSV File

Column 4 and 5 of the CSV files are designed to be edited within a spreadsheet editor such as Microsoft Excel. The simplest way to achieve this is to store patch files that include all the usable I/O, then copy and paste these cells into the appropriate row of the new file.

Any console channels whose routes are not imported from the file will retain their current console routes on load. A CSV row with no input device or route will not make any changes on a console when loaded, retaining audio on this path (see Ch #3 below).

[2] Channel ID is based on a formatted channel's mono equivalent path count. Input channels of 7.1 and 4.0.4 formats will have the same number of unique channel IDs and routing will be mapped across. Similarly channel ID X:2 of a 5.1 path is R, while it is C of an LCR path and the route will be mapped based on channel ID.

To explicitly clear a channel of its current route, "NONE" must be entered into the Input A Route column. The Input A Device and Device Type columns can be left blank (see Ch #2 below).

If a patch file is stored on a console when no route is currently active to a channel's input A this will store as a blank entry in the CSV. As a passive blank entry this will not unmake a route when loaded, if a route to that channel exists when it is loaded the route will be retained.

[PatchData]					
Ch #	Ch Leg	Ch Name	Input A Device	Input A Route	Device Type
1		1 Kick	i16	5	Dante
2		2 Snare		NONE	
3		3			

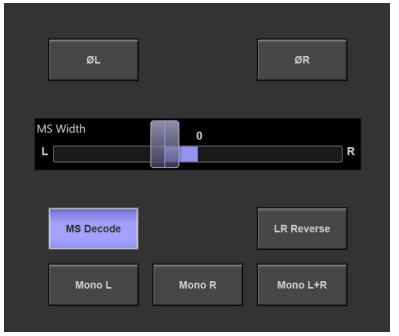
Mic Parameters

Whenever a mic input is routed to a console's channel, the mic parameters stay with the channel and are pushed to the newly routed mic. However if that same mic is also routed to a different channel on the same console, this different channel will already 'own' the mic parameters, and the new channel will inherit these settings. This matches the 'first in wins' ownership philosophy found throughout System T.

The same philosophy exists within patch manager, the mic parameters stay with the console channels, and are pushed to the newly patched mics. If that same mic is also routed to a different channel on the same console, this different channel will already "own" the mic parameters, and the new channel will inherit these settings.

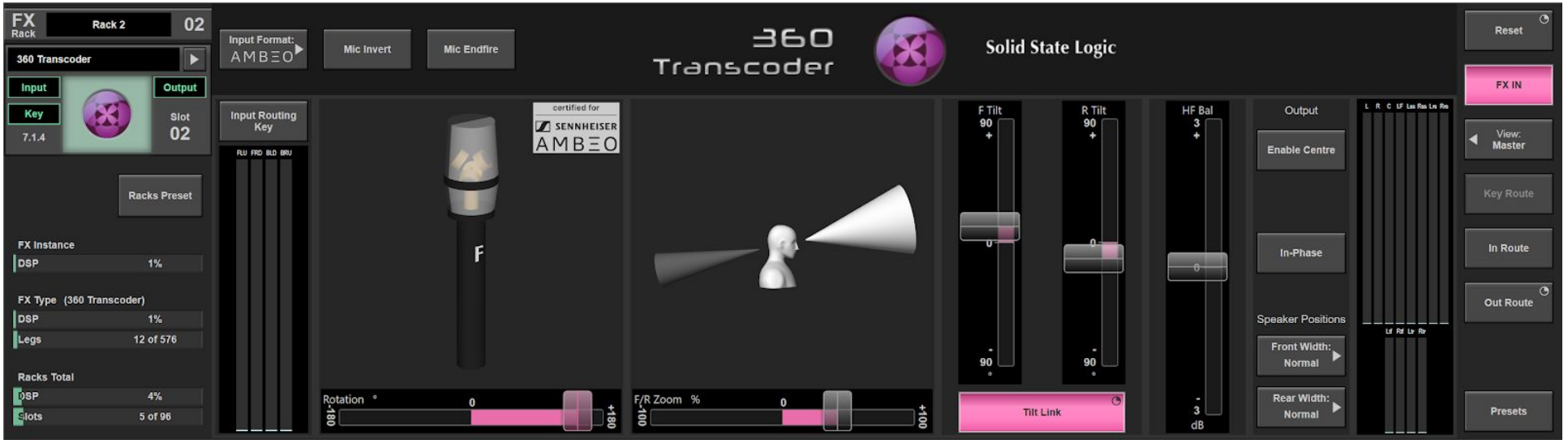
M/S Decoder on Stereo Paths

An M/S decode option is available on the input section of stereo paths. When enabled, MS width control provides a differential gain between the mid signal (on the L input) and the side signal (on the R input).



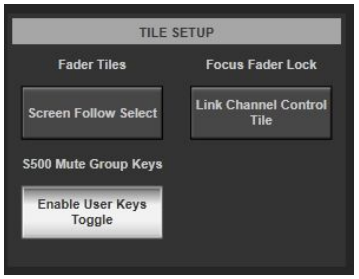
Sennheiser AMBEO VR Mic Support

The 360 Transcoder FX unit now includes the coefficients to directly support the Sennheiser AMBEO VR Mic. SSL are part of the certified for AMBEO program.

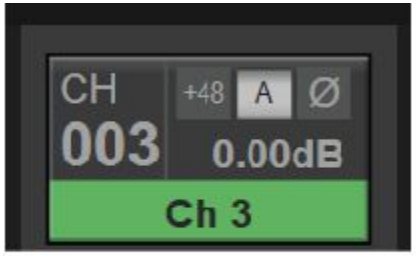


Mute Group Buttons as User Keys

On the S500 and S500m surfaces, mute group keys 1-9 can also be used as user keys. This feature is enabled in **Setup | Options | Surface | Tile Setup**. When enabled, the lowest physical key on the tile (labeled “0”) toggles the keys from being mute groups (0 is orange) and user keys (0 is green). The S500 mute group soft key 1 to 9 assignment is managed in **Setup | Options | User**.



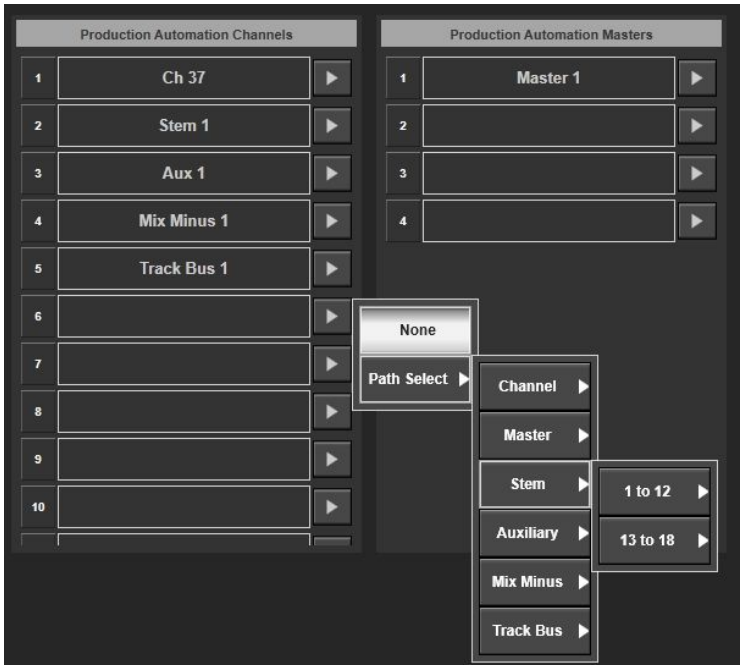
Double Tap to Open Specific Detail View



Improved navigation to specific detail views is provided with the ability to double tap the input section, fader, bus or processing selection areas. Double tapping any of these 13 selection buttons opens the Detail View on the selected processing point for that specific path. If follow detail is turned off, the quick controls across the console will also move to the selected processing block on the last used page. With follow detail on, the quick controls below that Channel View will automatically control the opened Detail View.

Production Automation Control of Stem, Aux, MM and Track Path Types

All audio path types can now be targets of production automation control. Previously only SSL channel and master paths were controllable.



SSL's production automation protocol exposes control of a number of parameters to external systems. Typically these controls are used for production automation, but they can be used for other types of integration. From the external system there are two types of mappable paths, "channels" and "masters", these can be freely assigned to any path type and any path number on System T.

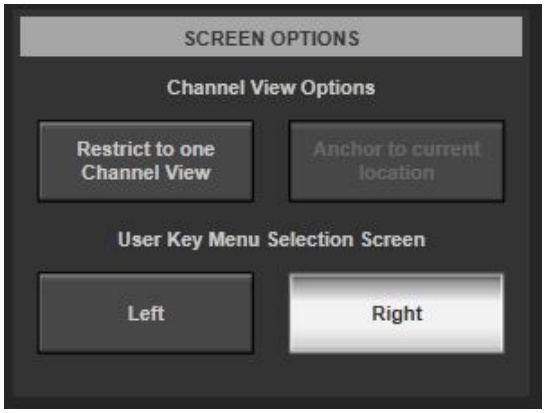
Parameters include:

- Console Name - SSL provides
- Console Information - SSL provides
- Channel Fader Value (Level) - bidirectional
- Master Fader Value (Level) - bidirectional
- Master Fader On/Off - bidirectional
- Channel Fader On/Off - bidirectional
- Channel PFL On/Off - bidirectional
- Channel Fader Mnemonic - SSL provides
- Master Fader Mnemonic - SSL provides

Communication is via the Studio Integration NIC on System T control surfaces and TCRs, using a freely configurable IP address and port 10001. Further details of the protocol are available on request. SSL are aware of tested implementations using this protocol including: Ross Overdrive, GV Ignite, Sony ELC, Viz Mosart and Axon Cerebrum.

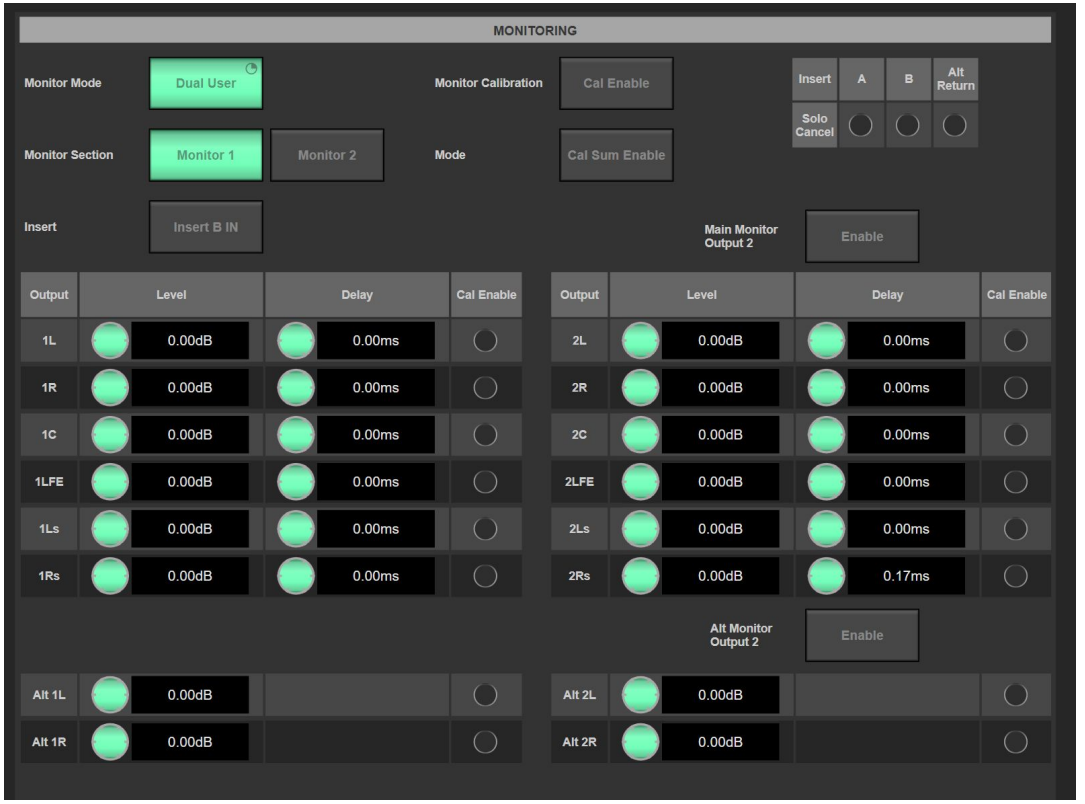
Target Screen for Menus From User Keys

For control surfaces with multiple screens, the screen on which menus are called from user keys is now selectable. The option is located in **Setup | Options | Surface** and is stored per console surface.

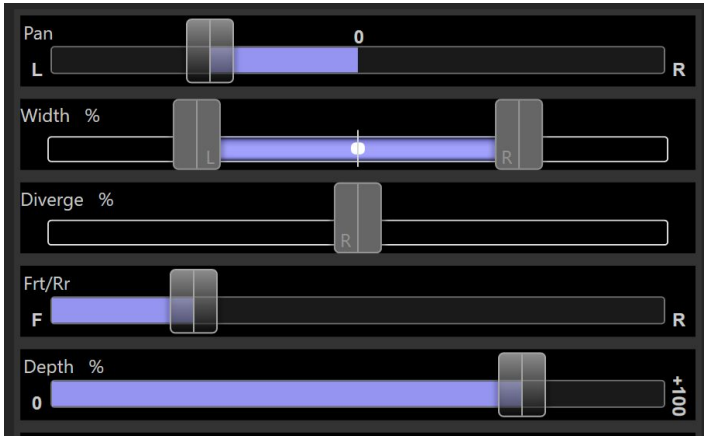


Monitor Output 2 Enable/Disable Option

Each monitor section has the ability to feed multiple speaker outputs including Main Monitor Output 1 and 2, plus Alt Monitor Output 1 and 2. The second outputs for both the main and the alt can be independently enabled and disabled. When enabled the speakers are switched using the channel view monitor popout or the push switch on the monitor encoders. Disabling output 2 prevents accidental switching to a speaker output that is not connected.



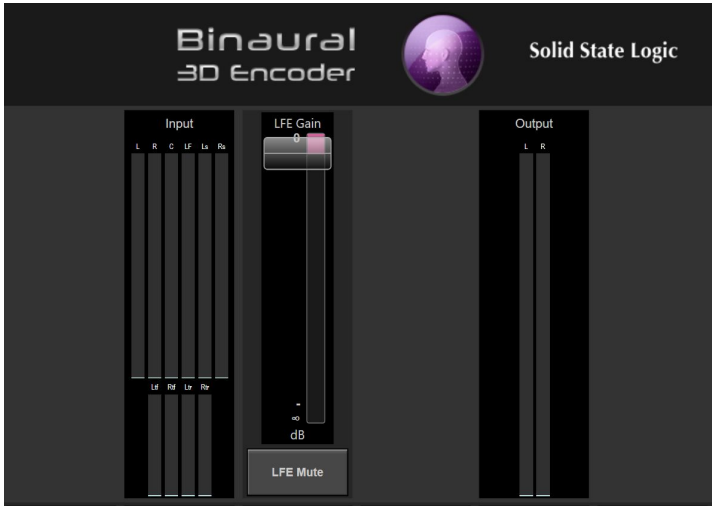
Pan Changes



Width and Depth automatically adjust if required when Pan controls are adjusted. The Pan behaviour has been modified so that adjusting the Pan control now automatically adjusts the Width parameter to achieve the desired Pan position. Previously the Width control would need to be adjusted manually before the Pan could be moved. Similarly, adjusting a path's Front/Rear Pan will now automatically adjust the Depth parameter to achieve the desired Front/Rear Pan position.

New FX Rack Modules

Binaural 3D Encoder FX Rack Module



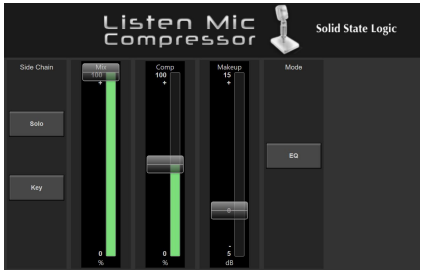
With input formats from 4.0 to 7.1.4, the Binaural 3D Encoder FX expands System T's immersive and 3D audio toolkit. The binaural encoder provides the ability to monitor immersive beds for Dolby Atmos AC-4 or MPEG-H via headphones where additional speakers are not available, or provide a stereo binaural feed for streaming purposes. The binaural 3D encoder uses the Google/Sadie II HRTF dataset.

Modulation FX Rack Units

- Chorus
- Phaser
- Flanger

Dynamics Units

- Transient Shaper
- Listen Mic Compressor



Delay Units

- Ping Pong Delay
- Echo Delay

Other Features

- Addition of national and regional flags in Eyeconix
- Copy and path link selected path interaction improvements
- Options | Network - headings renamed for clarity
- Dante labels supported with generic Dante devices (not only SSL SB devices)

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System T

V2.3.19 Feature Release Notes

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PLEASE READ ALL INSTRUCTIONS, PAY SPECIAL HEED TO SAFETY WARNINGS.

E&OE

Document Revision History

FIRST DRAFT (V2.3.17)	Tom Knowles	8th Jan 2020
Second Release (V2.3.19 bug fix)	Tom Knowles	20th Jan 2020

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  - Matrix Mixer
  - Improved Dynamic EQ
  - Spectra-lyser Spectrogram and FFT Analyser
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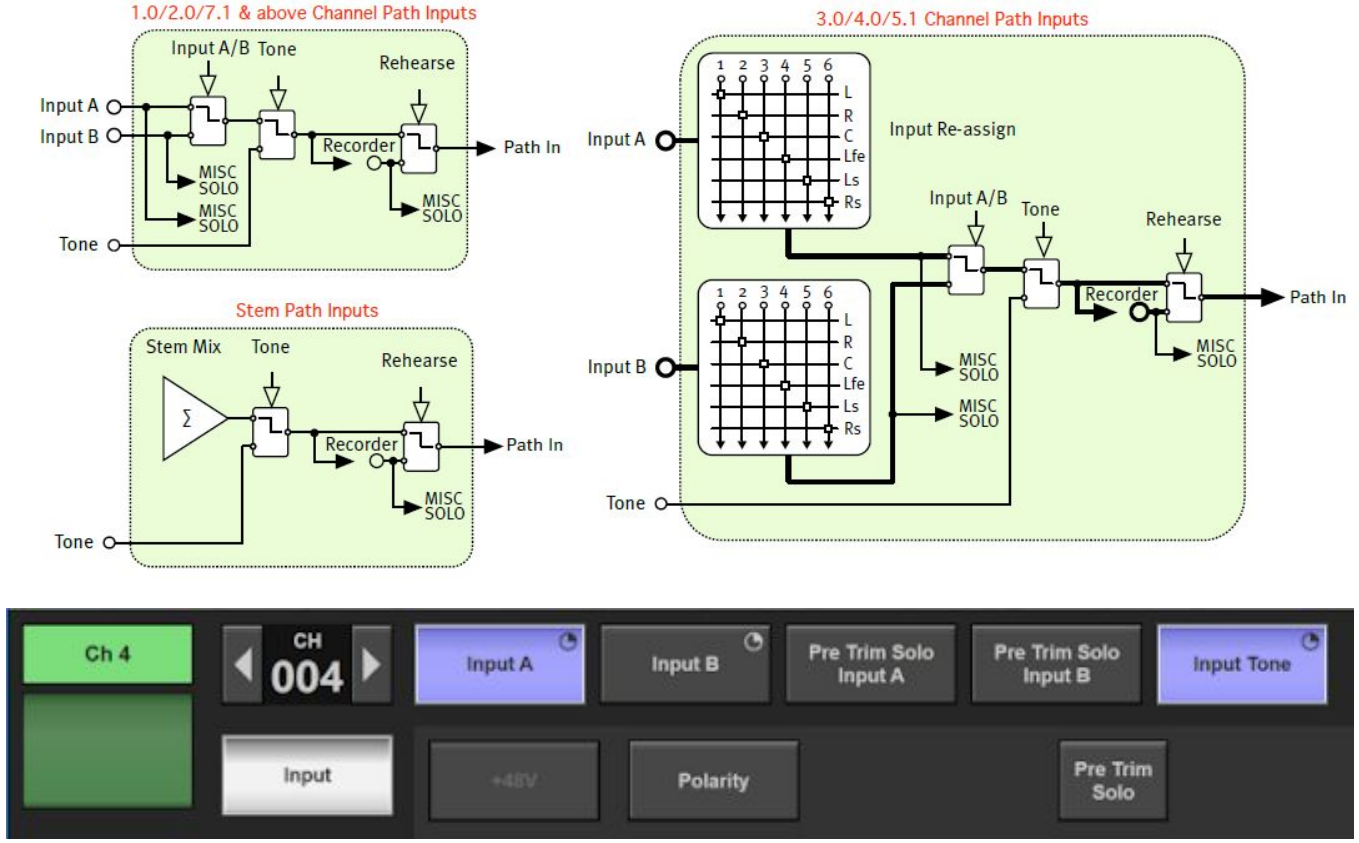
Introduction

This document covers the features of System T V2.3.x control software release. Update instructions for V2.3 are provided in a separate document.

Features

Tone on Path Input

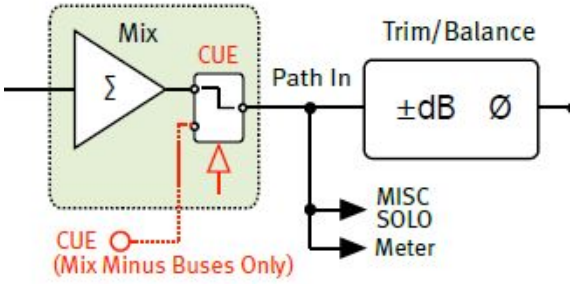
Channel and Stem paths now include an **Input Tone** inject to aid with signal path checking.



This inject point can be switched from the input detail view, user keys and the events system. An inhibit input tone option is also included in the Path Live and On Air switching feature. Alternatively a macro can easily be programmed in the event system to turn off all input tone injects via a user key or GPI.

Cue Input on Mix Minus Paths

An additional input that can be switched per bus on all MM (mix minus) paths. Each MM has its own independent cue feed.



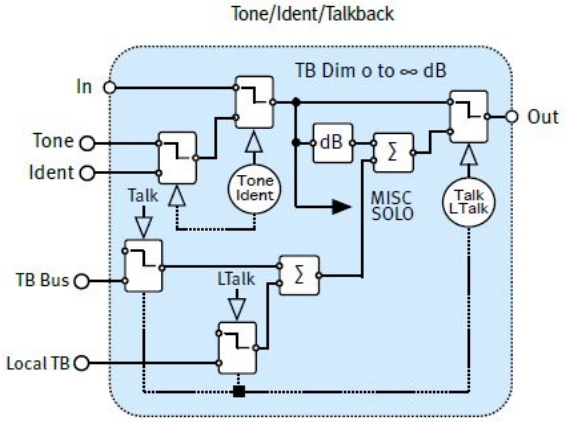
This allows the MM output to be sent a specific “cue” signal when required, typically an off air signal that tells the person at the other end they have reached the correct external line, but potentially another bus signal (e.g. an Aux) when building conferencing systems.

The cue input matches the format of the MM bus, it can be patch routed from the MM path channel detail view (input page) or the main routing GUI.

Switching between the cue signal and standard MM source can be done from the MM path channel detail view (input page), from the user key and events manager system, plus from the new backfeed controls including auto cue (see later).

Local TB Inject

All path types have an additional **Local TB** inject point in the path output block, **Local TB** can have a unique source for every path.



Put another way, there is a new destination per path that is labelled **Local TB** in the routing software. This signal inject point matches the path format, allowing you to achieve TB to left, rather than TB to both on stereo paths if required[1].

Local TB sums with the **TB** bus inject. Both engage **TB Dim** gain for the bus signal. Control and routing of **Local TB** is from the input detail view. **Local TB** can also be engaged from the user key or events manager systems, and the new backfeed feature for MM paths.

When used alongside **Path Live** transmission modes, the “inhibit TB to bus output” option inhibits both **TB** and **Local TB** for these master and stem buses.

[1] Setting the **TB Dim** independently for the spilled legs and leaving silence routed for **Local TB** right will allow customisation of a TB to left config

Backfeed Mix Minus Controls

System T's **Backfeed** feature is a collection of tools for use with remote or outside source signals. When configured, backfeed greatly reduces the complexities of dealing with remote signals by providing control of the return signal directly from the source channel path. When combined with the additional signal inject options **Backfeed** allows flexible (manual), or automatic (state driven) communication with remote sites and/or conferencing situations.

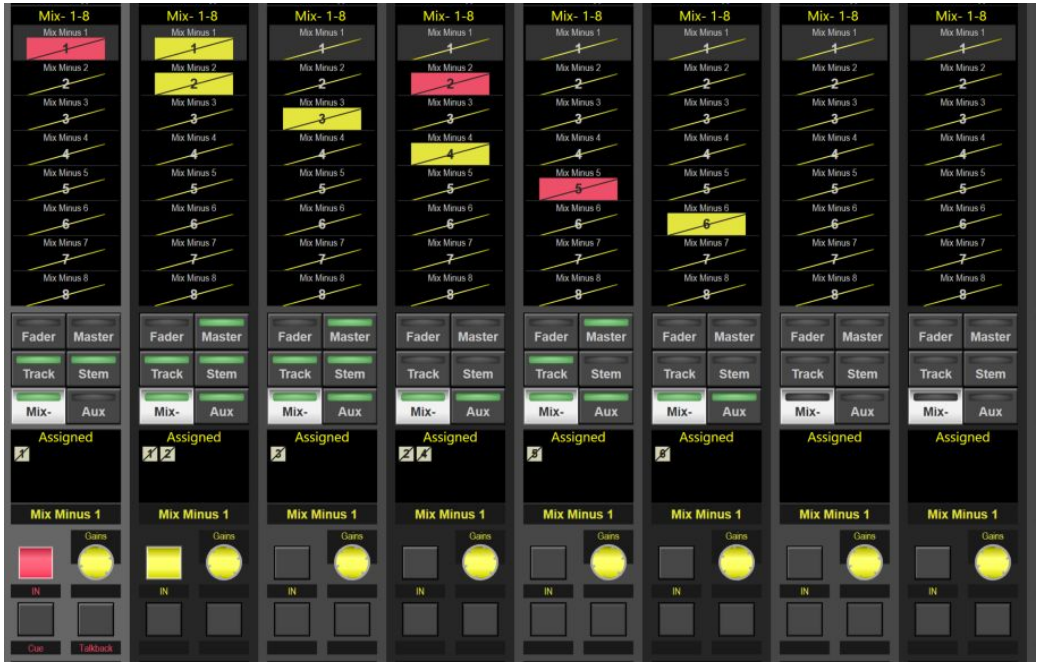
From the MM (mix minus) detail view for the remote source channel, the user can assign a MM bus to be that channel's "backfeed bus". As with standard MM, assignment removes this channel's signal from that bus, **Backfeed** assignment also maps controls for that bus output directly on the channel path. **Backfeed** assignment is shown with a strikethrough red indication, rather than the standard MM yellow.

New **Backfeed** parameters:

- **Bus Gain** - mapped to the MM path fader level to control the bus send output level
    - **0dB** switch for this fader
- **Auto Cue** - auto switch to the cue signal when the channel fader is closed - see later
- **Cue** - mapped to the new MM cue state, also a tally of the cue state of the assigned MM **Backfeed** bus
- **Solo** - mapped to the **Backfeed** MM output solo function
- **Tone** - mapped to the **Backfeed** MM output tone inject function
- **Ident** - mapped to the **Backfeed** MM output ident inject function
- **TB** - mapped to the **Backfeed** MM output TB inject function
- **Local TB** - mapped to the **Backfeed** MM output Local TB inject function

These are “virtual” controls that only control parameters when a **Backfeed** MM has been nominated for that channel.

Quick Controls



In Channel View with follow detail off or the channel detail closed the quick controls horizontally show the controls for the selected MM bus. If the MM is the **Backfeed** of that channel, the Cue and Talkback controls are automatically pulled through to that channel’s quick controls.

Auto Cue

The switching of the cue signal for the **Backfeed** MM bus can also be driven by the channel fader state[2], allowing the MM send signal to be automatically switched when the channel is closed.

- Channel path fader open and path unmuted - **Backfeed** MM Bus takes Mix Minus
- Channel path fader closed and/or path muted - **Backfeed** MM Bus takes Cue signal

Additionally the Cue button acts as a tally for what signal is actually going to the bus. The Cue switch can be manually used to force cue on at any point, this overrides **Auto Cue**.

Manual Cue	Auto Cue Enabled	Channel State (Fader, Mute and VCA)	Signal to MM Path	Cue Tally State
OFF	OFF	Open	Mix Minus	Dim Backlit (available)
OFF	OFF	Closed	Mix Minus	Dim Backlit (available)
OFF	ON	Open	Mix Minus	Dim Backlit (available)
OFF	ON	Closed	CUE	Orange (Auto Cue driven)
ON	OFF	Open	CUE	Red (manually engaged)
ON	OFF	Closed	CUE	Red (manually engaged)
ON	ON	Open	CUE	Red (manually engaged)
ON	ON	Closed	CUE	Red (manually engaged)

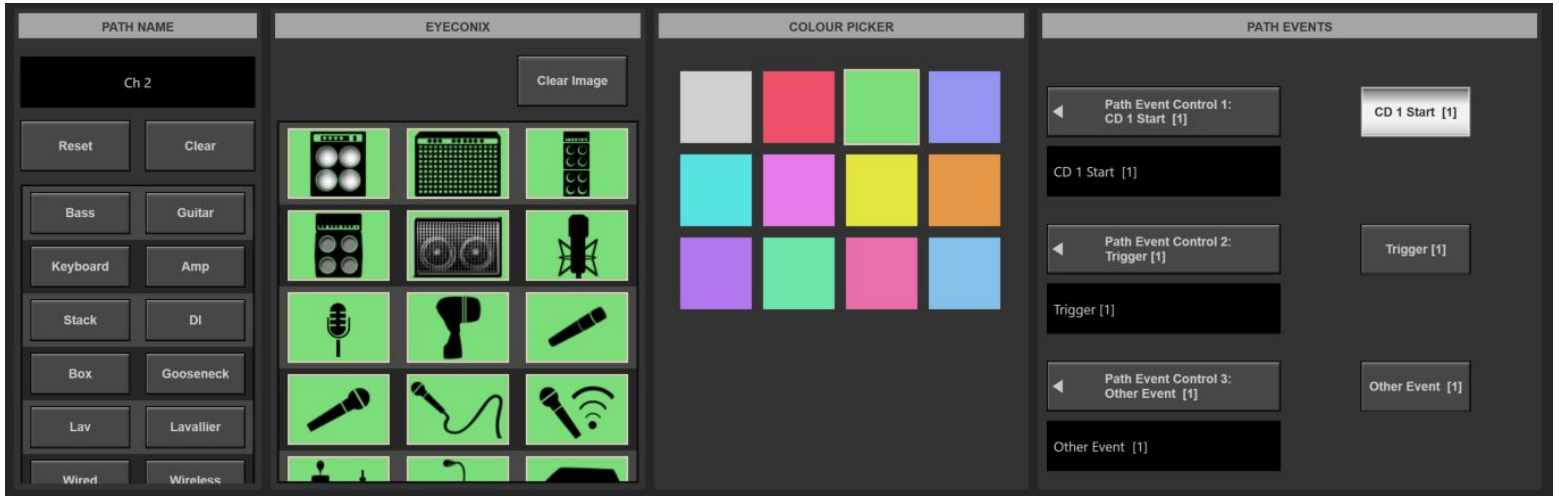
Backfeed and Event Manager

The per channel path **Backfeed** controls are available in Event Manager and on user keys. Assignment is possible even without a channel having a designated **Backfeed** bus, the mapped parameters are connected to the “virtual” controls that are part of the channel path. This allows an audio operator to alter **Backfeed** assignment and have the events system follow the new **Backfeed** bus.

[2] Fader state involves fader position, mute and VCA control

Path Event Controls

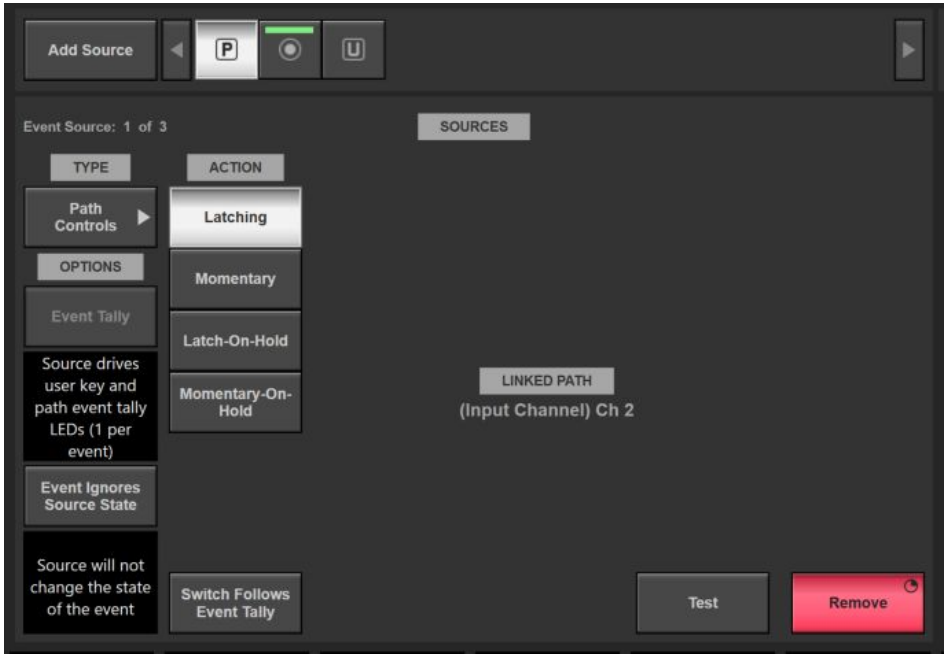
To provide control of GPIO, macros or other console functions directly from each channel path, Event Manager now includes a new category of event source, **Path Control.** Each path has 3 control switches, therefore on a T80 configuration this provides up to 2400 assignable switches. The events can be assigned to these switches and controlled from the Eyeconix detail view in each path.[3]

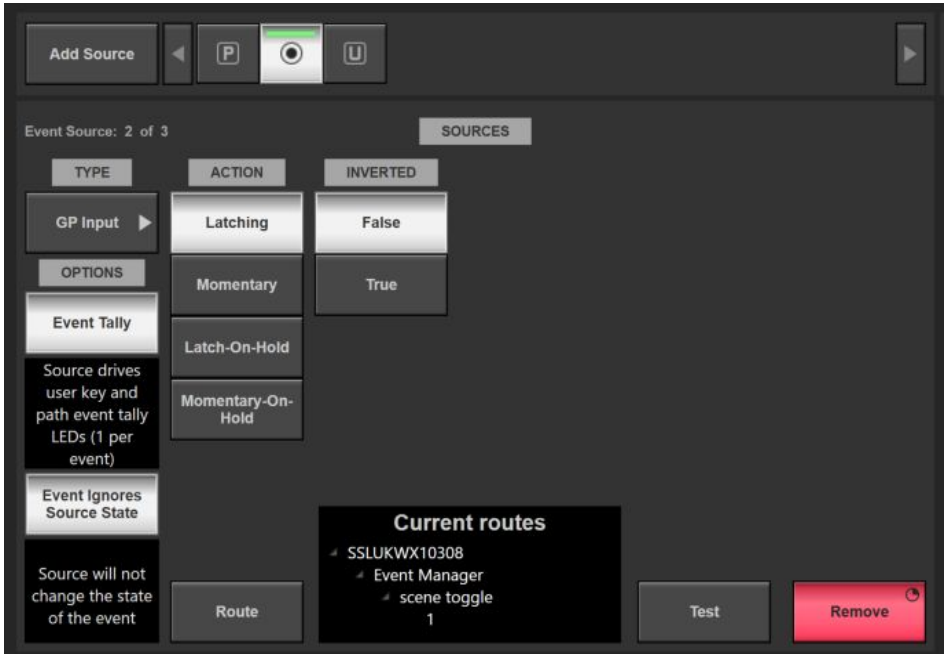


Control is also available on the physical quick control switches on the fader tile from the new **Events** quick control page. In Channel View, with follow detail off or the channel detail closed, the quick controls can be navigated to the events page by touching the Eyeconix area[4]. Alternatively calling the “Quick Controls : Path Event Controls” from a user key can immediately bring these controls to the tile. As with all quick control pages, the quick control navigation arrows (top right of fader tile) can be used to access the event control/Eyeconix page (last page to the right after delay).

The same action options that are possible with user keys are available for path events (latching, momentary, latch-on-hold and momentary-on-hold). Each event can have one path control source. Path events include a switch follows event tally option that should be used with the new event tally feature. User keys now also have this option.

[3] Note the path delay GUI is now shown in its own detail view
[4] There is no encoder assignment in this page





Event Tally

An option that allows one event source to become the source of the **event tally**, lighting any event source user key or path event key “lamp” with the selected source’s state. This allows an external machine to provide the user key a tally, or can be used with internal console functions to show their state rather than if that user key has triggered a function.

For each user key or path event source **switch follows event tally** can be used to choose if the switch state follows the event tally, or stays following the switch state. If **switch follows event tally** is on, then the switch itself turns on with the event, the next switch press will turn it off and drive the event off. If **switch follows event tally** is off, then the switch would have stayed off (even though its LED was lit), the next press would turn it on and drive the event on.

The user designates this event source to be an **event tally**, the GUI then shows the state of this source (green = high). When configuring a source as the **event tally** it is automatically set to **event ignores source state** so that this source does not trigger the event. Typically you would not want an external device sending a tally message to also fire the event, this may even cause a constantly looping state change with external devices.

Event ignores source state can also be used without event tally as a way to prevent configured event sources firing an event.

It is worth noting that GPIO in the events system can be used to internally connect events to events. This can be useful if an event tally needs to correspond to multiple sources (**active/any/all** logic). One event combines the sources with the required logic, then a GP output from this event is routed internally to a GP input of a second event which is connected to the user key/path control event and has event tally enabled.

Dante Domain Manager Integration

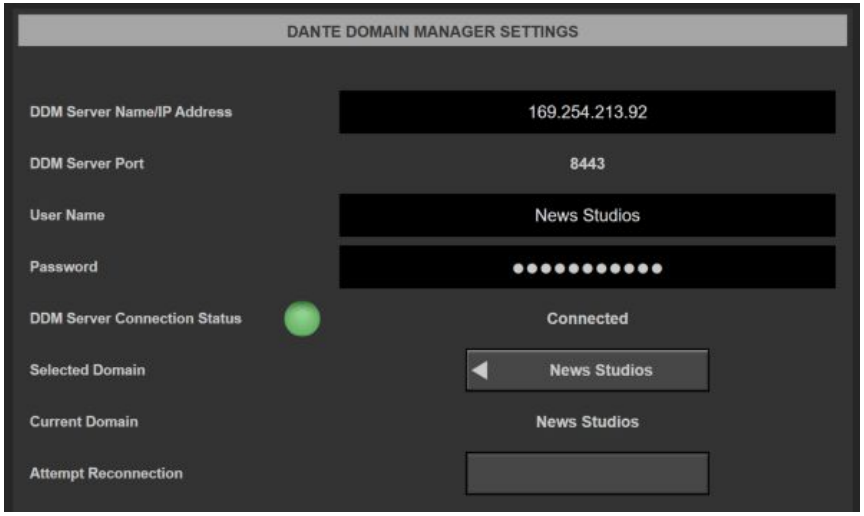
Audinate's Dante Domain Manager provides additional control, reach, security and tracking for Dante installations. It includes features to allow the use of devices to be restricted to particular users, expand Dante networks beyond a subnet and provides advanced system logging.

It also contains the tools required for ST 2110 configuration. ST 2110 information is in the next section of these release notes. DDM login from console is NOT required for ST 2110 functionality.

This video provides further information about the DDM feature set.

Domain Login from Console Surface

Dante Controller is a routing client that uses the Dante API, System T control software is also a routing client that uses the Dante API. From V2.3 it is possible to log a control surface into a particular Dante Domain as configured in DDM.



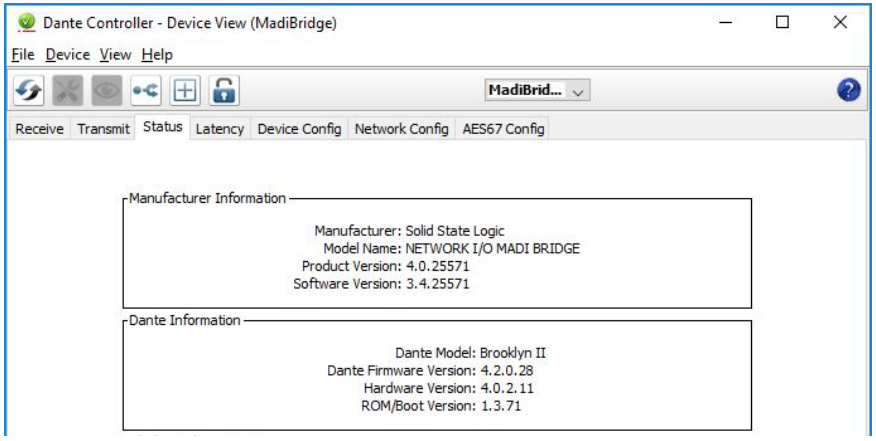
System T uses the Dante API to route I/O to and from console internal signals through the HC interfaces in the Tempest Engines, this dynamic routing allows the console to resource share a much larger I/O count than the AoIP interface in the processing engine. As a routing controller System T needs to be in the same domain as the HC cards providing the Tempest Engine connectivity. The DDM user account must have routing capabilities, therefore set as "Operator" or "Administrator" roles in the domain being used. The user and role settings are in DDM. It is advised that the surface or controller is rebooted after configuring DDM settings on System T. DDM settings can be restricted in Access Control, if DDM is used these settings should be restricted so that the console is not accidentally moved into the wrong domain.

AES67, ST 2110, ST 2059 and ST 2022-7

Dante firmware version V4.2 and higher (for BkII and HC devices) includes some changes to AES67 operation and also the ability to work with DDM managed ST 2110 (including ST 2022-7) streams, plus configure clocking as per the PTP profile ST 2059-2.

DDM login from console is NOT required for ST 2110 functionality.

As part of the V2.3 System T package the Network I/O devices will require updating to these versions. From this release the **Manufacture Information | Product Version** will be used to manage Network I/O device versioning. This will allow future .dnt updates to be managed from Dante Updater and provide a single version number that summarises both the SSL and Audinate sections of the dnt image. SSL Network I/O units with Product Version V4.0 or higher include the ST 2110 updates.



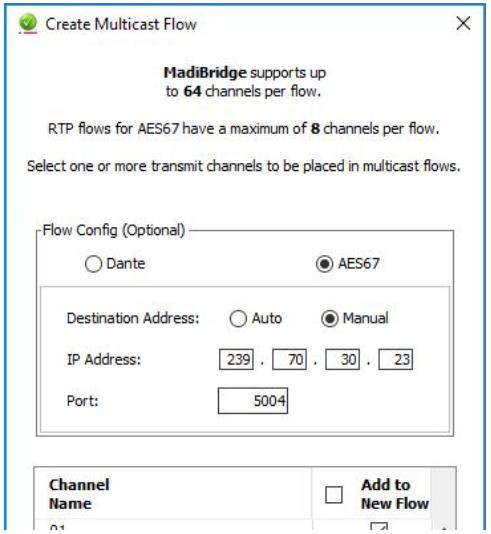
Unmanaged Domain AES67

As before, AES67 operation is possible without the use of DDM. Audinate have adapted their AES67 implementation to make this more interoperable. The changes are:

- The offset between media clock and RTP stream clock is now zero. Previously as per the AES67 specification and RFC 3550 this offset was a random value set at stream creation. Many implementations avoided this requirement and chose to use 0, ST 2110 requires 0. Dante unmanaged AES67 implementation now uses 0. (See Appendix B in this AIMS document.)
- Manual multicast address assignment is now possible in Dante Controller.

As previously, AES67 streams in unmanaged mode are primary network only (no ST 2022-7 support).

As per the recommendation in AES67 the PTP domain is 0 in unmanaged Dante AES67 mode. For manual PTP configuration DDM is required. The use of DDM and the security it provides prevents someone breaking the networks by adjusting PTP settings.

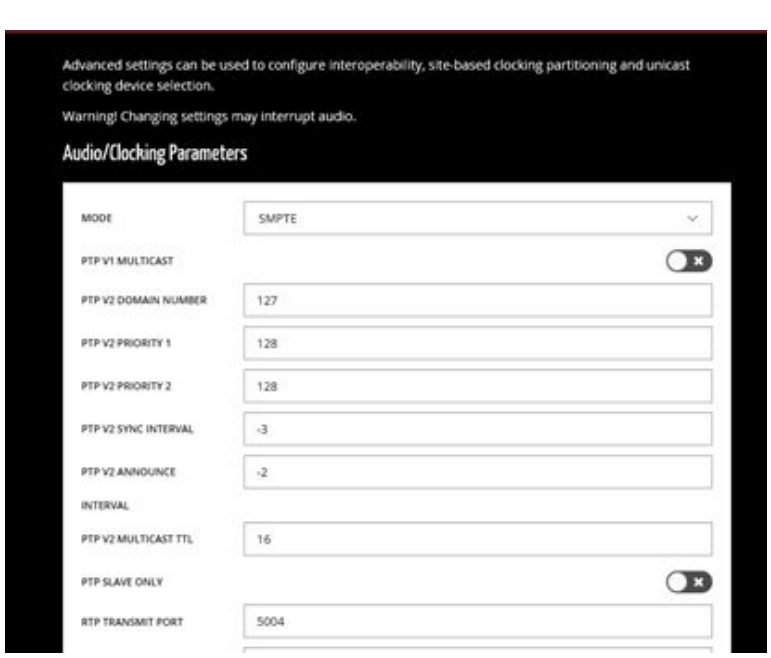


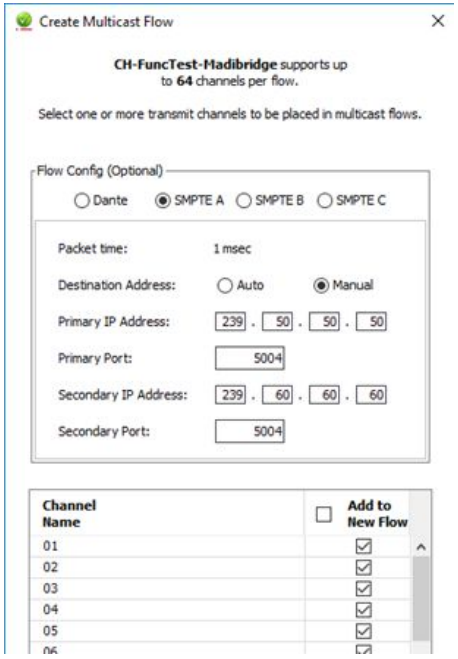
AES67 mode enables PTPv2 on Dante devices. One device acts as a boundary clock between PTPv1 and PTPv2, multiple devices can simultaneously use Dante and AES67. PTPv1 and PTPv2 can be mixed on a network. Clocking hierarchy is still determined by BMCA (best master clock algorithm). For manual PTP configuration including slave only mode DDM is required.

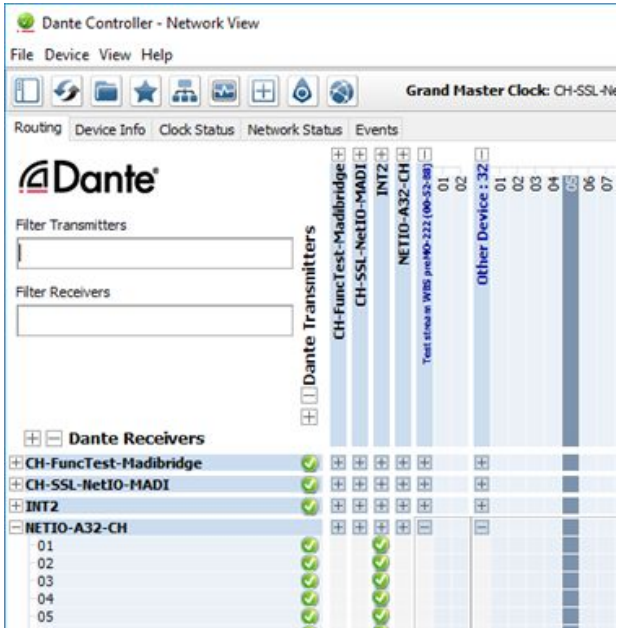
Managed Domains

DDM provides all the manual PTP settings required to use Dante devices in heavily managed networks. This includes setting PTP domain numbers, slave only mode, PTP priority values, sync and announce intervals. This provides a central interface to manage multiple devices that can be set to follow the ST 2059-2 PTP profile.

When DDM is online, Dante Controller can be used to create ST 2110-30 streams of conformance levels A, B and C. These can all be supported simultaneously. SAP announcements will be automatically generated for these streams. If required the SDP file for each stream can be manually exported from DDM for external devices which don't support SAP.



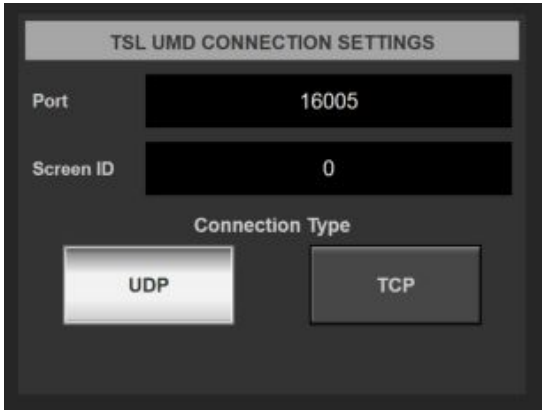




DDM also provides SAP announcements of manually entered SDP information for streams from non-Dante devices. These streams then show up in Dante Controller for patching from a centralised GUI.

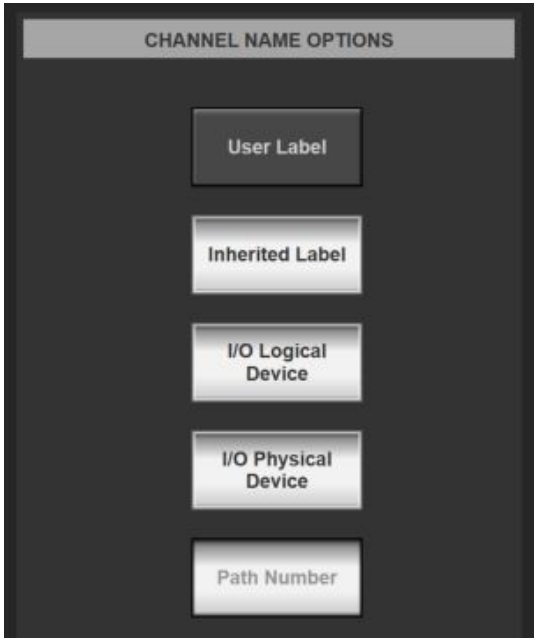
TSL UMD Mnemonics

Inherited labels for audio inputs can be provided by external control systems to a System T control surface via TSL UMD v5. The incoming labels are associated with logical devices so can be used on HC card VTL (Virtual Tie Line) Rx points, or device Tx signals. Whether an external routing control system is patching Dante routes or external router crosspoints, the control system can pass text mnemonics providing information of what signal is being sent to be displayed on the channel path name.



UMD v5 supports both UDP and TCP connection types. The port number and screen ID can be set manually. These settings must match on System T and the control system.

All logical input devices in I/O management GUI can have a UMD ID applied. These should be set to match the target in the control system.



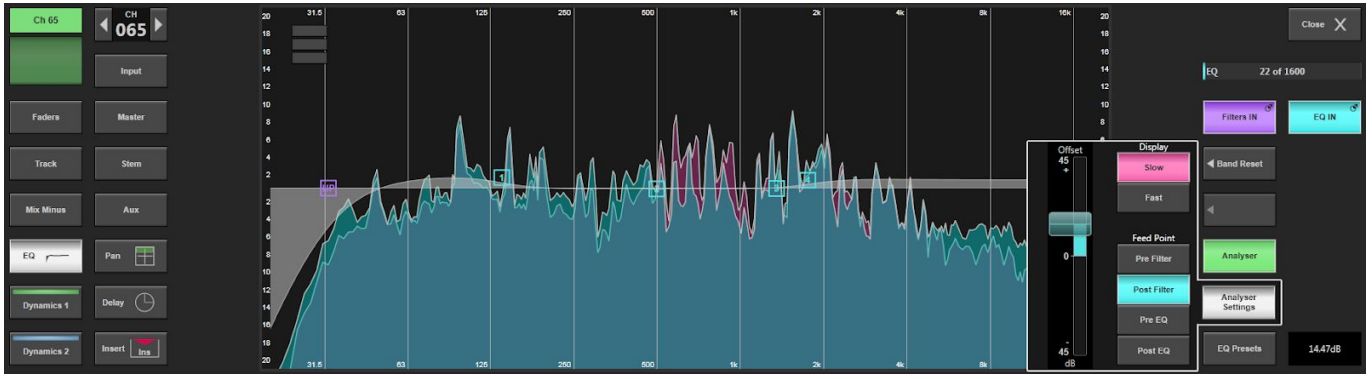
Enabling the **Inherited Label** feature for **Channel Name Options** in **Setup | Options | Surface** will pull through the UMD text to channels that have logical devices routed to the active channel input. These name options are hierarchical and if **User Label** is enabled and the channel has been assigned a path name, this will be shown over the inherited label.

Enabling and disabling each layer of labelling can be assigned to user keys and events, providing the ability to quickly swap the shown channel name.

Path EQ Analyser Overlay

A high precision spectrum analyser is now available as an overlay to the path EQ Detail View graph. Unlike other console-based spectrum analysers, this is a fixed-point-per-octave analyser, so has equal resolution across the entire frequency range, providing much higher accuracy measurements even at low frequencies.

Real time measurement of the path's signal is available from one of four points in the signal chain: pre/post-filters and pre/post-EQ. This can be configured per path, along with an **Offset** control for adjustment of the analyser graphics on the graph for optimum viewing. A global **Display** mode determines the update rate and amount of averaging applied to the graph.



Available on mono and stereo paths, not LCR and above.

The Analyser can be enabled from the **Setup | Options | Surface** menu and then be utilised from within the channel detail EQ page. An option to have the analyser follow the last selected path is available.

Full Screen T-SOLSA

Individual T-SOLSA application windows (Channel View, Overview, Automation, Effects, Setup) can now enter fullscreen mode by pressing F11. On a 1920x1080 resolution display this will remove the scrollbars and hide the Windows taskbar, enhancing the usability of T-SOLSA. Full screen applications can be navigated between with Alt+Tab or Win+Tab keyboard shortcuts.

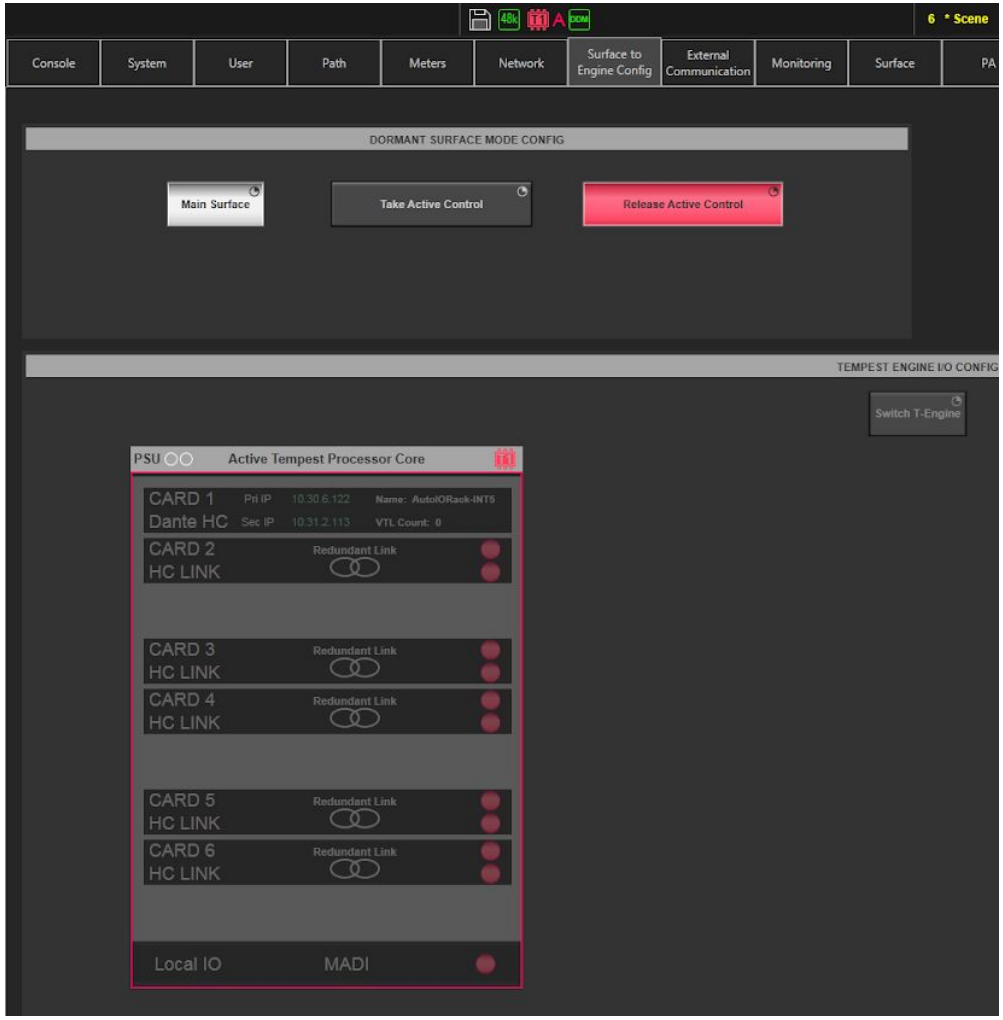
Control of Shure ANI22

The ANI22 is a Dante-enabled 2x mic-in plus 2x line-out interface from Shure. It is powered by PoE and is supplied with either XLR or block audio connectors. This makes it especially well suited for highly distributed installations.

Shure ANI22 **input gain** and **phantom power** can now be controlled directly from SSL System T consoles. This is a licensed feature in console software and can be enabled at the SSL factory or in the field with an .sslkey file. Pricing available on request, please contact Sales or Support for details.

Surface to Engine Config

An additional tab **Setup | Options | Surface to Engine Config** has been added. The **Tempest Engine I/O** GUI is now shown here. The name and VTL config of the Dante HC cards are now shown in the GUI as read only information for this surface. Editing the HC config can be managed via terminal commands or the import/export feature in the Service menu, care should be taken as these files are crucial to system operation.



A **Dormant Surface Mode Config** option has been added allowing the surface to release active control of the **Tempest Engine**. When the surface is dormant, both the OCP control and Dante control networks on this surface are passive, they are not sending instructions to the Tempest Engine(s) or Dante devices.

The target Tempest Engine is set with target OCP device IP addresses in the **Network** tab. It is possible to configure multiple surfaces to target the same Tempest Engine, only one surface can have active control at any one time. Taking active control from a surface will disconnect the currently connected surface. When the surface is dormant the status bar will show the Tempest Engines as offline (red) and display a red A, showing that you do not have active control.

Remote extension surfaces are still managed from the **network** tab and connected via the connectivity network. **Member extension** surface sections that automatically connect are still configured using the network group file. **Take Active Control** and **Release Active Control** are features of the main surface, not the remote or member extensions.

Take Active Control, **Release Active Control** and **Switch T-Engine** are also available from **Event Manager**.

FX Rack Additions

Matrix Mixer

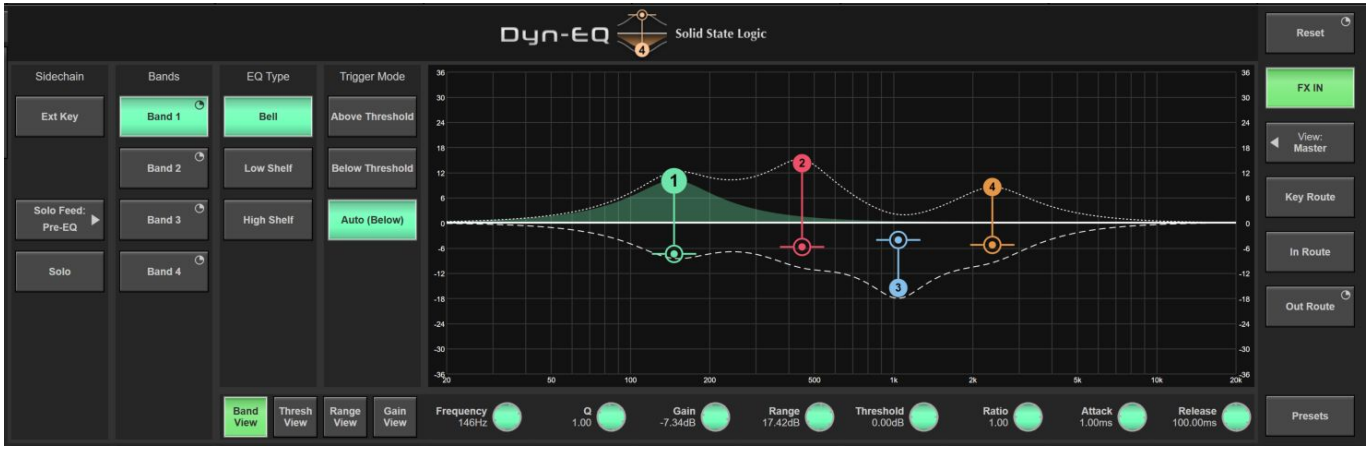
A new FX rack unit provides a **Matrix Mixer**. This is available in all formats (formats above 10 channels use a “large” version of the matrix mixer). The **Matrix Mixer** has a variety of uses including downmixing, level based upmixing, submixing and PA matrix mixing.

Each crosspoint can be set in circuit with an individual gain from off to +10dB. Double tapping each crosspoint will allow numerical gain entry via a keyboard, alternatively the quick encoders in follow detail mode can be used to set the crosspoint gain. Navigation up and down matrix mixers with more than 6 inputs is achieved by swiping the touch screen or using the **Prev** and **Next** quick control switches to the left of the fader tile. Each output includes a mute control. Input and output signals can be renamed by enabling the **Edit Names** feature and double tapping the desired name. **Lock** prevents accidental adjustments of mutes and cross points whilst also preventing opening the keyboard from the touchscreen.

For PA feeds the matrix outputs can be brought back into channel or bus paths (e.g. via insert returns) for fader level control, EQ and other processing.

Improved Dynamic EQ

The 1-, 2- and 4-band **Dynamic EQs** in the FX Rack have undergone a significant redesign.



Baseline Gain Control

A new **Gain** parameter that sets the baseline gain from which the Gain Range (previously labelled Gain) parameter operates. This can be used to apply a 'static' (not signal-dependent) amount of EQ. Gain Range (abbreviated to **Range**) determines the largest gain boost/cut that the dynamic (signal-dependent) portion of the effect will apply, now relative to the baseline **Gain**.

Increased Q Range

The maximum **Q** (filter width) value has been increased from 1.5 to 10, meaning narrower filters can now be achieved.

Threshold Trigger Modes

A new per-band **Threshold Trigger** function has been added that allows the threshold trigger to operate in one of three ways:

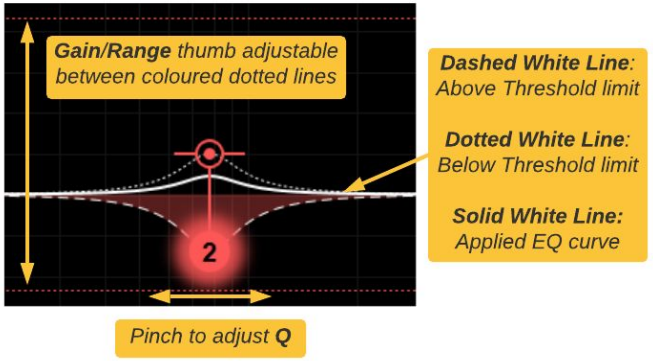
1. **Auto** (previous behaviour): EQ triggered when sidechain signal is above the **Threshold** if Gain **Range** is negative, below **Threshold** if Gain **Range** is positive.
2. **Above Threshold**: EQ triggered when sidechain signal is above the **Threshold**, regardless of Gain **Range** setting.
3. **Below Threshold**: EQ triggered when sidechain signal is below the **Threshold**, regardless of Gain **Range** setting.

Graph Based GUI

A new graphical interface incorporates the revised parameters described above and adds better visibility and control of multiple bands in a gain vs. frequency graphical interface, colour coded by band.

The ‘bullseye’ thumb indicates the baseline **Gain** applied to each band. The round thumb adjusts the **Range** of each band. Pinching the graph when either thumb is highlighted adjusts the **Q** of the band.

Dashed and dotted white lines indicate the **Above** and **Below Threshold** limits respectively. The solid white line plots the applied EQ in real-time, between the **Above** and **Below Threshold** limit lines.


Gain/Range thumb adjustable between coloured dotted lines
Dashed White Line: Above Threshold limit
Dotted White Line: Below Threshold limit
Solid White Line: Applied EQ curve
2
Pinch to adjust Q

Four control views are available for the 2- and 4-band variants. These controls are displayed at the bottom of the page and also mapped to the Quick Controls when Follow Detail is enabled.

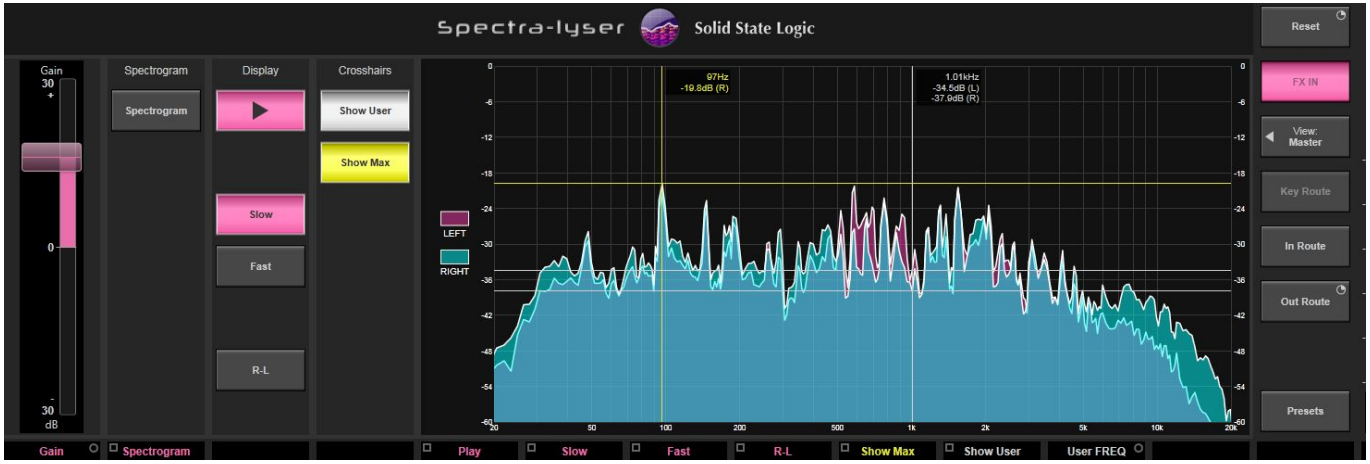
1. **Band View**: Provides access to all controls (**Frequency, Q, Gain, Range, Threshold, Ratio, Attack** and **Release**) for the selected band.
2. **Threshold View**: Provides access to **Frequency** and **Threshold** for all bands.
3. **Range View**: Provides access to **Frequency** and **Range** for all bands.
4. **Gain View**: Provides access to **Frequency** and **Gain** for all bands.

As per the original Dynamic EQ, an External Key input can be routed from any source available to the console (including other channels, buses, FX rack modules etc.).

All instances of the original Dynamic EQ in showfiles will be converted to the new style and all previous settings will be retained for backwards compatibility.

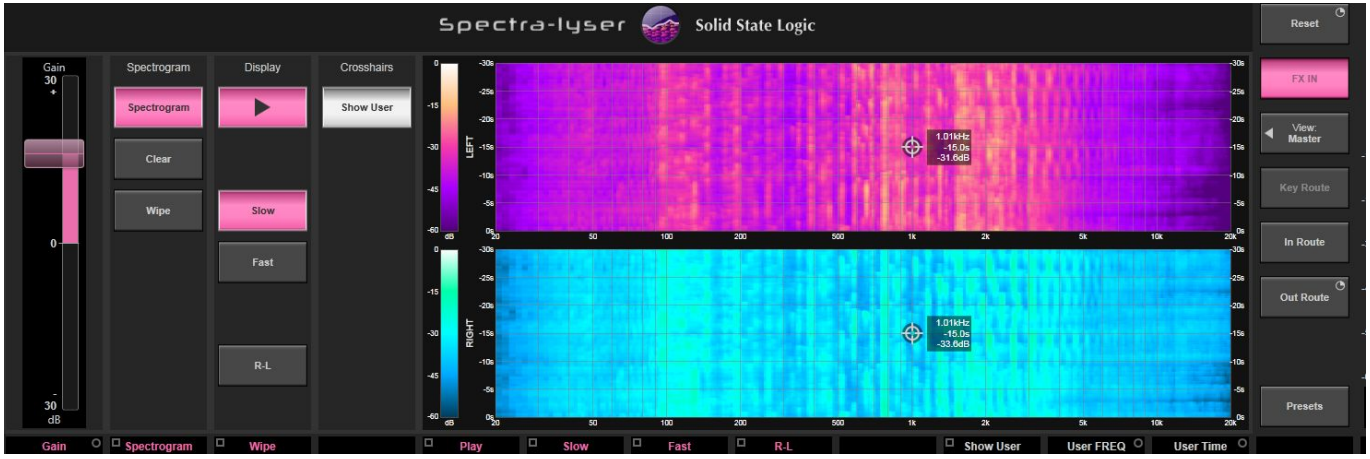
Spectra-lyser Spectrogram and FFT Analyser

The Spectra-lyser replaces the FPPO analyser FX module. The standard Spectra-lyser view presents a fixed-point-per-octave spectrum analyser, providing high resolution analysis even at low frequencies. The Gain control allows a level offset to be added to the incoming signal to optimise the level for display. Max Amplitude and User configurable frequency crosshairs are also provided. A Play/Pause function allows the graph to be paused for further analysis. The stereo version also features a difference (Right-Left) mode, each input can be routed from a different source for comparison.



The **Spectrogram** view provides a graph of frequency content over time, displayed as a heat map. The same averaging, play/pause and difference modes are also available in **Spectrogram** view.

The graph update style can be set to one of two modes: **Wipe** or **Scroll**. In **Wipe** mode new values are displayed moving down the display, wrapping from one end of the graph to the other. In **Scroll** mode, new values are displayed at the bottom of the graph, with historical values displayed moving up the graph.



All existing instances of the FPPO-lyser in showfiles will be converted to the new **Spectra-lyser** module and all previous settings will be retained for backwards compatibility.

Other Features and Improvements

- SRC on Network B SB32.24 & SB16.12
- Improved pan visibility in lower context window
- Assignable Ember+ port number
- Added current routes GUI to MIDI events entries
- Network IO physical input mute feature shown on Channel View
- Dynamic Automation Discard and Revert added to Event Manager
- “Take all” and “Release all” options added to Input Ownership on I/O Setup GUI
- Dante devices update channel capabilities in I/O setup when sample rates are changed
- Path names now truncated when there is not enough space in the Channel View
- Improved error reporting when Patch Manager routes fail to be made
- Momentary-on-hold option for user key, GPI and new path events sources
- Channel “view” mode that shows bus routing in the upper context window keeps quick controls in the current assignment
- Standardised all Network I/O model names
- Physical I/O devices in I/O Management follow the sorting options in I/O Setup
- All surface NICs have EEE turned off during software installation - EEE accidentally enabled previously caused DAW ipMIDI issues
- Channel View will stay on last layer and bank selected when selected from the screen
- Delay frame rate set from Frame Rate GUI when System clock source not video
- Next and Previous DAW control user key entries now illuminate their switch when pressed
- Member connected FPPs can be set to “not be part of the main surface,” so they do not power off with a main surface shutdown
- Admin Import / Export now allows loading of IO database, HC config and surface config files on a console - care should be taken and this feature should be left restricted by access control
- Network I/O Controller DDM integration
- Network I/O Updater DDM integration
- Layer manager now uses channel name options as per channel view including; I/O physical, I/O logical and inherited label
- User keys highlights currently assigned selection in menu tree

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System T

V3.0.14 Feature Release Notes

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E&OE

Document Revision History

V1.0	Tom Knowles	10th July 2020
V1.1 – V3.0.14 bug fix addition	Tom Knowles	3rd Sept 2020

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Introduction

This document covers the features of System T V3.0.14 control software release. Update instructions are provided in a separate document.

Features

Updated Embedded OS

With V3.0 System T software the embedded OS is updated from Windows Embedded 7 to Windows Embedded 10. Transitioning to Windows 10 allows continued updates including all of Microsoft's latest security additions, plus additional future console features layered above the Embedded OS. This update future proofs your system allowing for full integration within a secure modern broadcast facility.

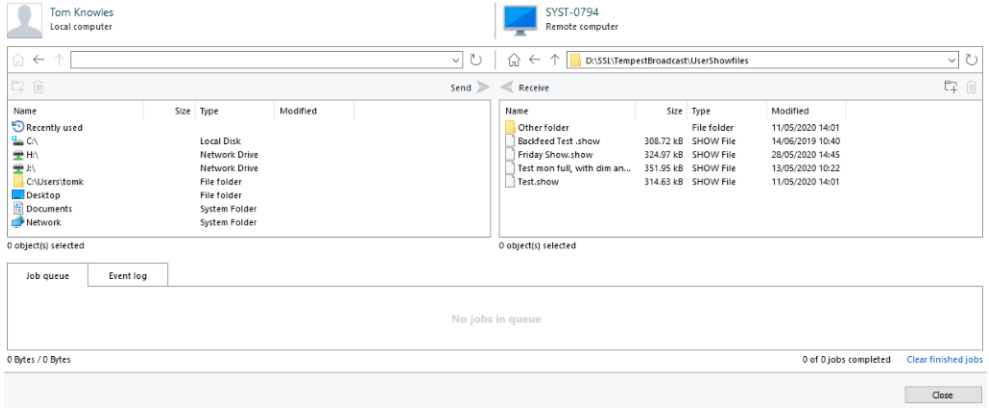
The Embedded OS update is completely transparent to the operational user. The underlying OS is only used at the back end and remains a "black box" to the console user. Access is securely locked down and restricted by a single use code.

The Embedded OS requires a licence to match the surface variant, covering the various Windows 10 licences within your system. The SSL licence is provided in the form of an .sslkey file to be imported onto your console via **Setup | Service | Licence.** The key file is tied to hardware within your system and will be provided by your SSL support team. Support cannot be provided for an unlicensed OS.

TeamViewer

System T now fully supports running TeamViewer directly onboard the console for remote access. Enabling remote support, remote configuration, and at home control as if you were sat directly in front of the console. Working from home or anywhere in the world with a standard internet connection you can directly access the console and all software control features from any computer or touchscreen device. Full TeamViewer support is provided and can be enabled by contacting SSL Support or during commissioning. Clients may choose not to install or enable TeamViewer if they prefer, the console software ships without TeamViewer installed.

All TeamViewer features are deployable at the client's discretion, including unattended access for admin use or circumstances where building access is not achievable. Files can be transferred between the local computer and remote console from within TeamViewer to upload showfiles or retrieve logs.



Broadcasters will use their own licence to connect to their own consoles, but do not need a licence if SSL support is required (SSL Support have licences).

TeamViewer does not replace the function of a remotely connected T-SOLSA. T-SOLSA allows additional control positions looking at the same console, where T-SOLSA has independent front panel features from the main console (e.g. selected path, quick control assignment etc.).

A TeamViewer connection connects to the main surface and mirrors what is shown on any screen. Any changes from within TeamViewer will also change at the console GUI. The TeamViewer connection cannot have a fader tile connected locally at that computer, unlike T-SOLSA.

ST 2110/AES67 RTP Routing from the Console

Intended for use with converged Dante and ST 2110 networks, V3.0 includes discovery of ST 2110/AES67 RTP streams as physical devices in the routing database. Connection management, with audio shuffling, from RTP stream to console destinations (e.g. channel inputs) and RTP enabled Dante devices is supported from the console routing GUI. To achieve this for a converged Dante and ST 2110 network:

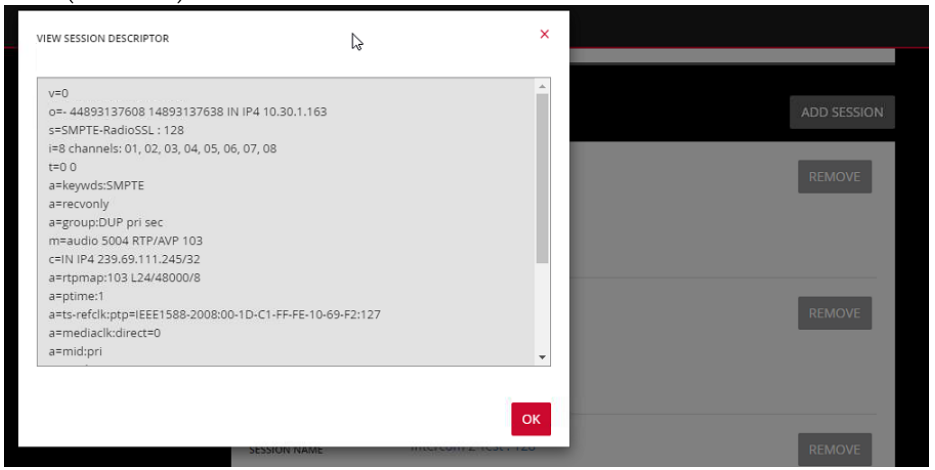
- Enrol all Dante devices in a managed domain with SMPTE PTP management
- Have the System T control software logged into DDM as an “operator” (or higher) role
- Deploy DDM as an HA (high availability) cluster (requires DDM Platinum)
- Add SDPs for all streams required to be visible at the console as “external sessions” in DDM

As ST 2110 streams are predominantly used for infrastructure routing with video equipment, using DDM as the proxy for stream sessions is the preferred method for integration, although other SAP SDP servers could be used. This deployment allows for static stream allocation and creation in advance, with dynamic subscription to these streams as the user requires. The advantage being that streams are connected when required and recalled by the showfile, rather than permanently subscribed at the receiving device. Devices are not plug-and-play in the way adding audio centric Dante enabled devices can be.

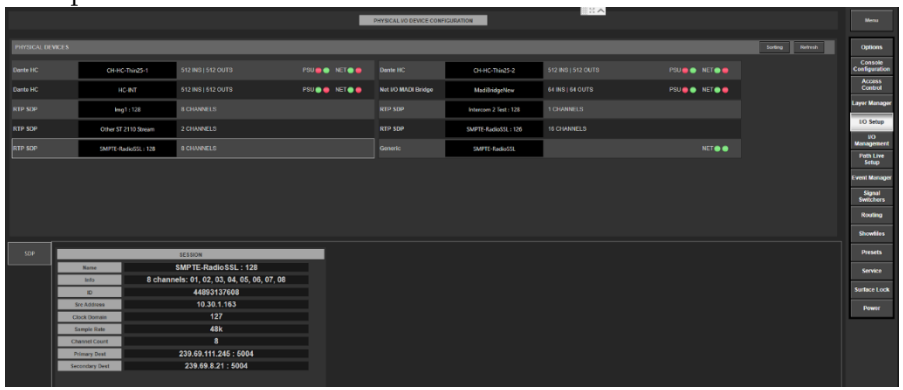
Commissioning and Using ST 2110/AES67 RTP Routing from the Console

1. Get the descriptions of all the ST 2110 streams the facility will configure and want the console to have visibility of. This is best if provided as SDP info, otherwise create appropriate SDP files based on the information provided.

2. Add the external sessions to the SAP proxy server (i.e. DDM):

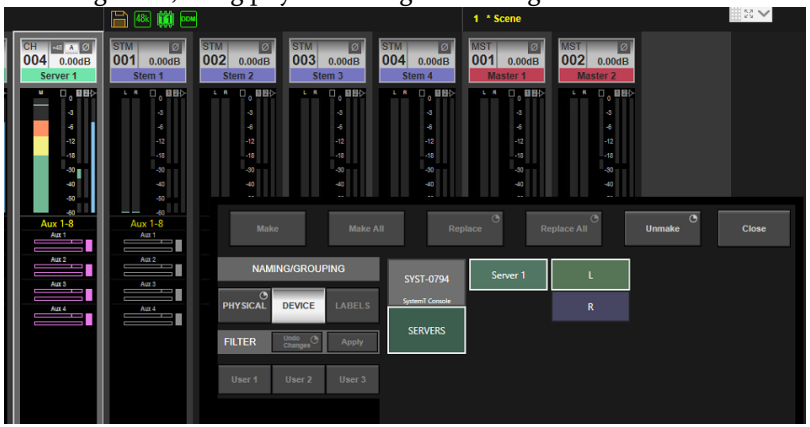


3. The sessions will be discovered and displayed in Setup | I/O Setup as “devices”. The device type is RTP SDP, the name from the session displays as the physical name and the channel count is shown. Unlike SSL Dante devices there are no PSU or NET status LEDs, there are no standard APIs for all devices to display this information. When selecting the “device” the detail view shows further pertinent information from the SDP:

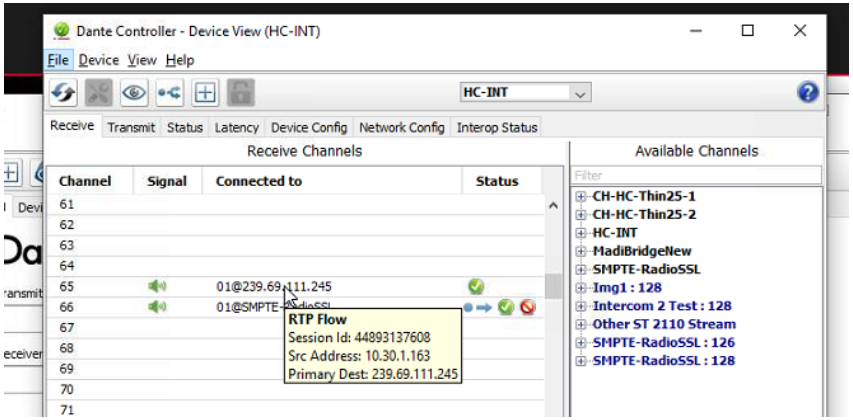


4. Use I/O Management to create logical devices from the RTP SDP “physical device” in the same way you would for Dante devices:

5. Route signals as normal from the channel or system routing GUIs, using physical or logical routing views:



6. For console routing the subscription will happen on available dynamic routing capacity above the VTLs, e.g. Rx 65 and above. Dante Controller can display more session information about the connected stream, the same sessions will show as available channels in blue within Dante Controller:



7. Connecting RTP streams to other Dante receiving devices is also possible form the console GUI.

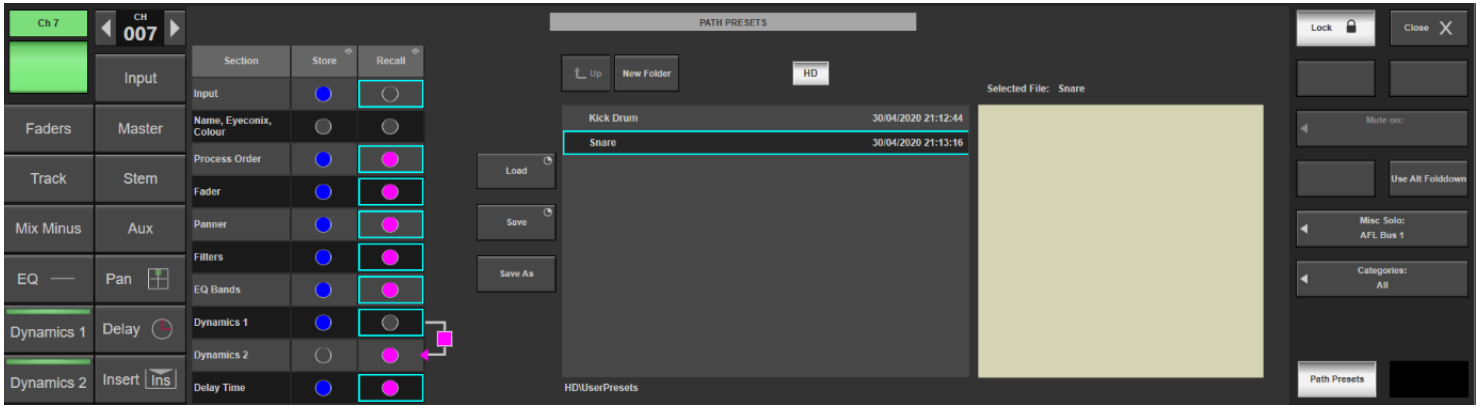
8. For console Tx RTP streams: use VTLs and create SMPTE multicast flows from Dante Controller:

PHYSICAL OUTPUTS
LOGICAL DEVICES - OUTPUTS
Create Logical Device(s)
Edit Logical Device(s)
FILTER
Create Multicast Flow
HC-INT supports up to 64 channels per flow.
Select one or more transmit channels to be placed in multicast flows.
Flow Config (Optional)
Dante SMPTE A SMPTE B SMPTE C
Packet time: 1 msec
Destination Address: Auto Manual
Primary IP Address: 239 . 50 . 1 . 5
Primary Port: 5002
Secondary IP Address: 239 . 50 . 2 . 5
Secondary Port: 5002
Channel Name
Add to New Flow

9. For device (e.g. SB) Tx RTP streams create SMPTE multicast flows from Dante Controller. The SDP can be found in DDM if required.

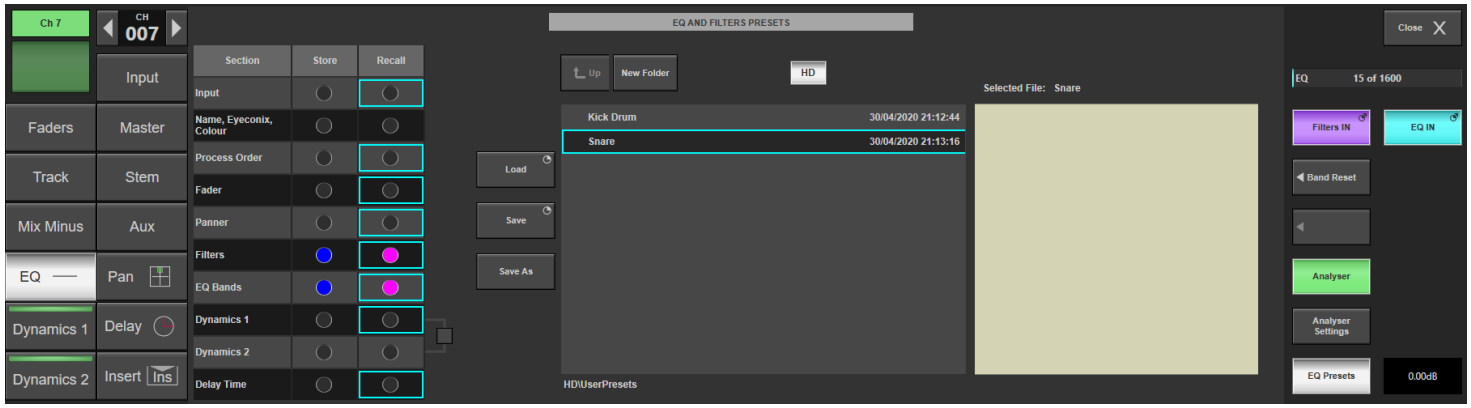
Path Presets

The presets feature for channel and bus paths has been completely overhauled. Multiple processing blocks can now be stored and recalled at the same time. Uniquely for a broadcast console store filters allow the user to selectively choose which processing block is stored, ensuring only the processing they have intentionally saved is recalled whenever that preset is loaded. Recall filters allow further granularity across what is, and what is not recalled, when loading a preset. An intuitive GUI using cyan boxes shows the user which processing elements are included in the selected file before the preset is loaded.

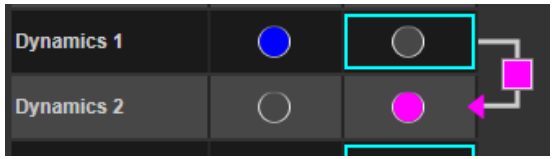


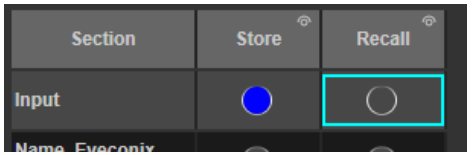
The **Path Preset** page with all processing blocks is found within the Eyeconix detail view. All presets can be loaded from this page, and all store and recall filters are available. The default filters for the path preset page are stored within the showfile.

When using the presets detail view for each processing block (e.g. EQ and Filters - shown below) only the store and recall filters for that processing are available, and only that area of processing from within the preset file will be recalled or stored. The user can navigate to each processing block only loading or updating that part of the preset:



For presets with only one dynamics block stored, the user can choose to recall these on either dynamics 1 or 2:





For fast setting of all store or recall filters the column headings can be tapped to set all filters on, or off, from the Eyeconix path presets page.

Preset files from earlier software (.pre) will be converted to the new file type (.preset) when the new software is installed or when loaded on a console running the new software. Only the new files will be visible in the System T GUI, but the original files are retained and could be used on an older version of software if required. Changes saved will only update the new preset files from V3.0 onwards.

On T-SOLSA you will be able to access all files through Windows Explorer:

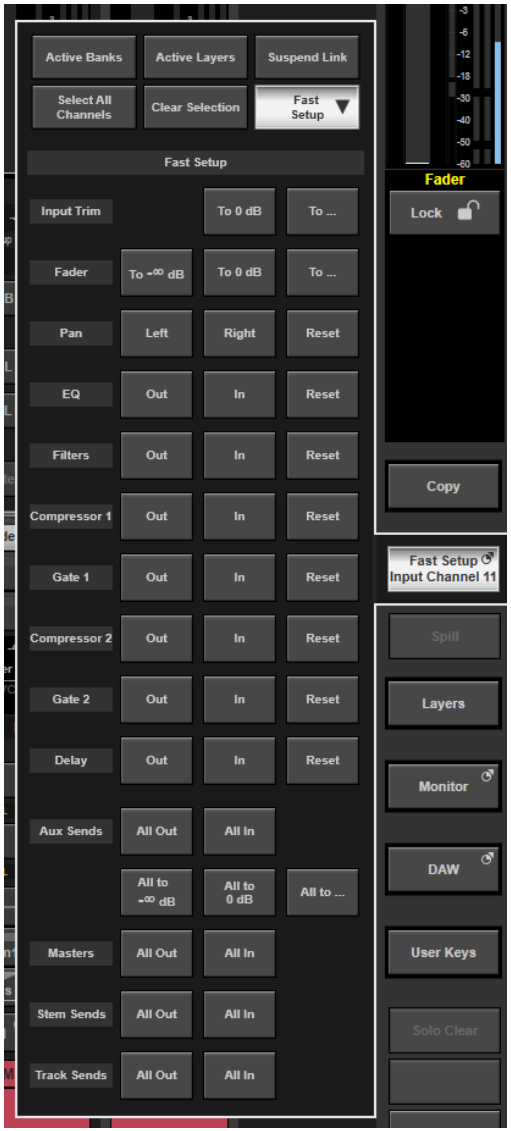
C:\Users\<user_name>\AppData\Local\SSL\TempestBroadcast\UserPresets

You may choose to “tidy” up these files by deleting the original .pre files. An XML file keeps track of files already converted so they are not converted again.

The original combined EQ and Filters .pre files can be loaded but save cannot be performed on this file. To take advantage of the new preset feature use “save as” to store a new filterable file including EQ and filters, plus other processing blocks if required.

Within each processing page only the presets that include that processing block are shown. A preset without panning will not show in the panning preset page. Depending on the size of your presets library and your workflow it may be beneficial to consolidate presets into fewer files or adapt your folder structure, particularly if you often loaded several presets on the same path.

Fast Setup in Path Link

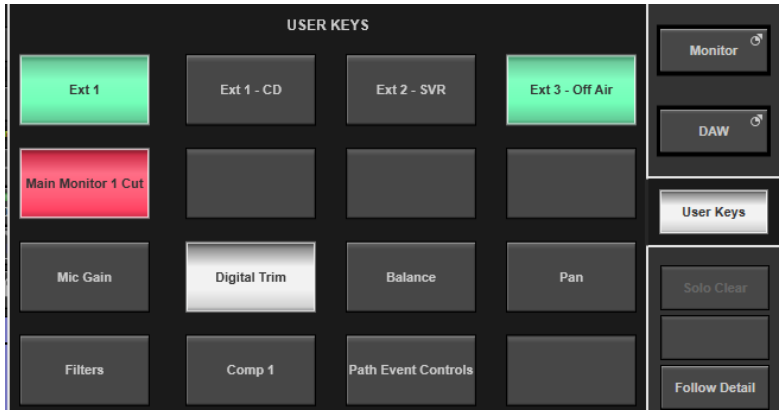


A **Fast Setup** feature has been added to the **Path Link** popout, allowing multiple parameters of many paths to be set from a single GUI. Console wide changes can quickly be made to all channels, busses, or a selective smaller subset. Processing can quickly be put in and out of circuit or reset. Levels including trim, fader and aux sends can be set to off, 0dB or given a specific dB value with a numerical keypad. Level changes can be applied in absolute or relative manner. When changing in relative mode offsets relative to the control path are maintained.

To use fast link first press and hold the side bar **Path Link** button, this opens the path link popout with the selection modifiers. The **Fast Setup** GUI can then be opened or hidden with the bottom right button. Like path link, a set of paths of the same format (e.g. channels, stems, masters, aux, mix minus or track busses) can be selected and are controlled together. The first path selected after enabling path link is the path being controlled (highlighted white on both the channel view and overview), other linked paths (highlighted cyan on both the Channel View and Overview) will follow changes made on this selected control path. If the selected control path does not have the capability to change the parameter, it will be unavailable. E.g. if the selected control path does not have EQ allocated, EQ reset is not available. To reset all EQs in the selected set use an alternative control path or put EQ in circuit for all paths in the set using this GUI, then reset.

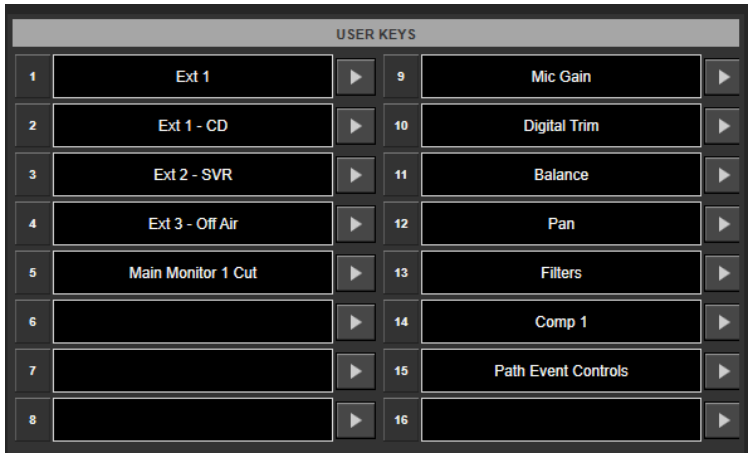
User Keys Pop-Out

A **User Keys** pop-out is available on the Channel View to provide user key functionality to TCR systems, as well as all console surface variants and T-SOLSA instances. Sixteen keys are provided. Frequently used functions and navigation controls can be freely assigned in **Setup | Options | User.** Assignments and names are stored and recalled with the showfile, allowing each show to be tailored to an event or operator's preference.



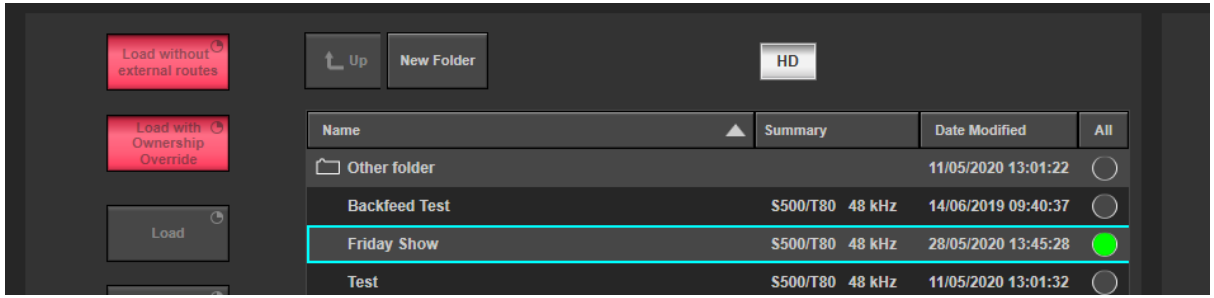
As with hardware user keys there are many uses, such as quickly switching functions that are needed during a show or providing a simpler interface for operators. The ability to assign quick control navigation, pushing the quick controls to a frequently used page (e.g. mic gain) is a common usage.

Each assignment can be renamed in the **Setup | Options | User** GUI by double tapping on the black area with white text:



Showfile Load with Ownership Override

System T (and Live) showfile loads respect a “first in wins” rule when considering parameter and routing ownership. If an audio output is already in use, the console will not “steal” this output, as it could be being used for something crucial like PGM distribution or a loudspeaker. Similarly, I/O control parameters such as mic gain have ownership and are not stolen, someone else may be using that input and have a gain set appropriately. Generally, you do not want to steal this and impose a potentially dramatically different gain. To efficiently use shared resources, routing and I/O ownership is removed when showfiles are unloaded or consoles turned off, freeing up these resources for the next time they are used by any console. “First in wins” is again an essential part of a fully resource-shared AoIP system, providing a safety feature to stop interruption of other user’s usage of the network. When output and control ownership are intentionally required, the operator can manually **replace** routing or **take** ownership.



Load with Ownership Override does not respect first in wins, it will automatically take ownership and replace any used routes as the showfile is loaded. The feature can be restricted from **Access Control** in situations where operators use a console on a shared network and the additional power needs to be restricted.

Load with Ownership Override is of particular use when considered with fly pack or modular systems where stageboxes move between systems. As clearing of resources relies on the console communicating with the stage box as the console is powered off, situations where power is killed at the stage before the OB or control pod may result in the stagebox storing previous ownership. Ownership override will load the showfile in full regardless of where the I/O units were previously used.

Shared resource systems across multiple studio floors, with multiple control rooms may encounter situations where a show needs to quickly move from one control room to another. Ownership override would allow the show to be loaded on the new console with all the same routes and control. I/O associated with each physical control room (e.g. speakers) would need to be managed via matching VTLs to ensure all required signals move with the room.

Quick Load Showfile

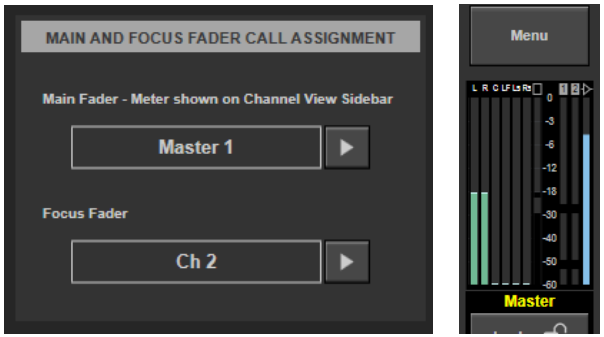
Five showfiles can be added to a new **Quick Load Showfile** GUI, ensuring occasional operators are directed to the correct showfile without having to navigate the whole showfile file structure. Assignment is via the **Manage User Templates** option and can be restricted via **Access Control**. With **Manage User Templates** enabled, select the desired show using the radio button at the right of the main file browser, then press and hold the **Assign** button on the appropriate slot. *Note: The assignment uses the showfile name, therefore if the showfile is renamed it will need assigning again.*

Each of the five load slots can also be triggered via the production automation interface, with a tally back to flag that the showfile has loaded and is ready to use. These commands have been added to the existing production automation protocol and are available on request for use in custom automation controllers. This is configured in **Setup | Options | PA** and if not being used should remain disabled to prevent unintended loads.

Each of the five load slots can also be triggered from the events system, providing the ability to load a specific showfile from a user key or GPI. Events are stored within each showfile, for consistent usage identical events and assignments are required across ALL showfiles on the console.

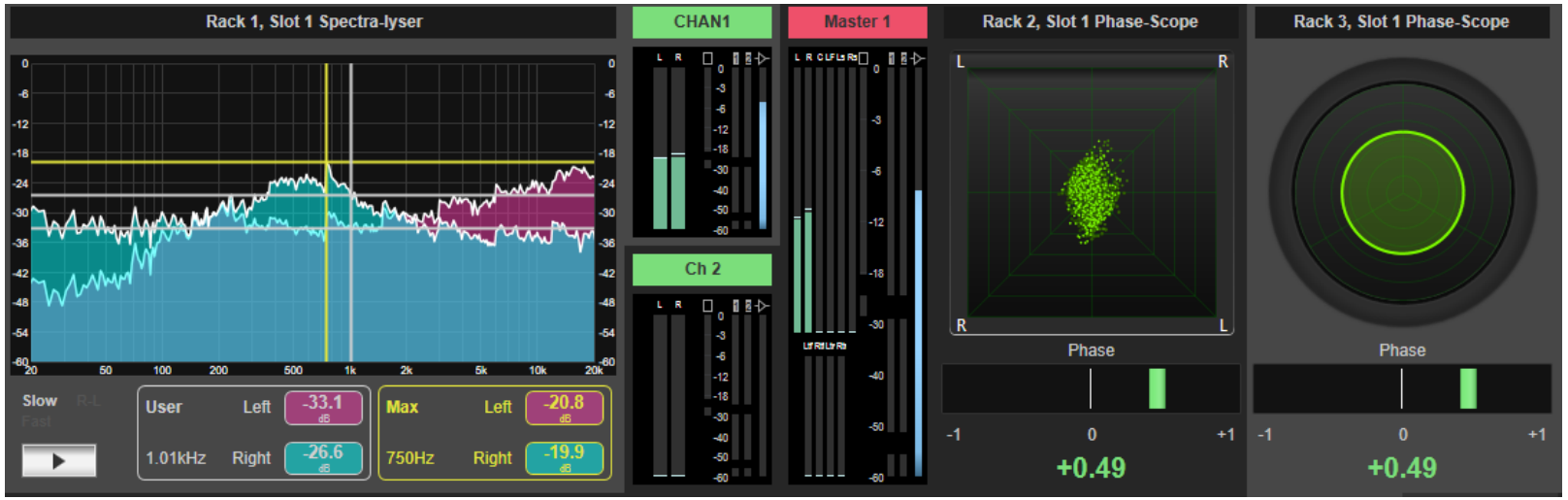
Main and Focus Fader GUI Assignment

In **Setup | Options | Surface** the main and focus fader can now be assigned from software without the required hardware tile. This allows for configuration from a TCR or T-SOLSA. The assignment is stored with the showfile. The main fader assignment provides the additional metering at the top right of the Channel View, particularly useful on a TCR where the master fader may not be on the main fader bank.



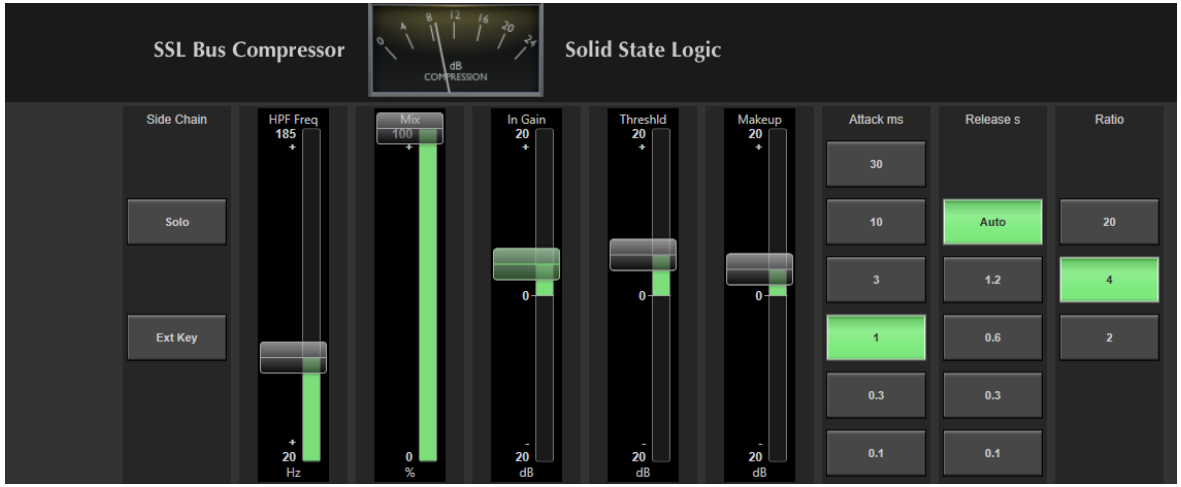
Meterbridge Effects Rack Additions and Improvements

The Spectra-lyser FFT GUI can be added to the meterbridge on S500 and S500m control surfaces. A meterbridge slot size of 4x2 is required. The user and max crosshairs, and numerical readout are displayed. The meterbridge stereo and LCR phase scope GUIs are improved to provide greater visibility of the graphs. All control is managed from the Effects Rack:



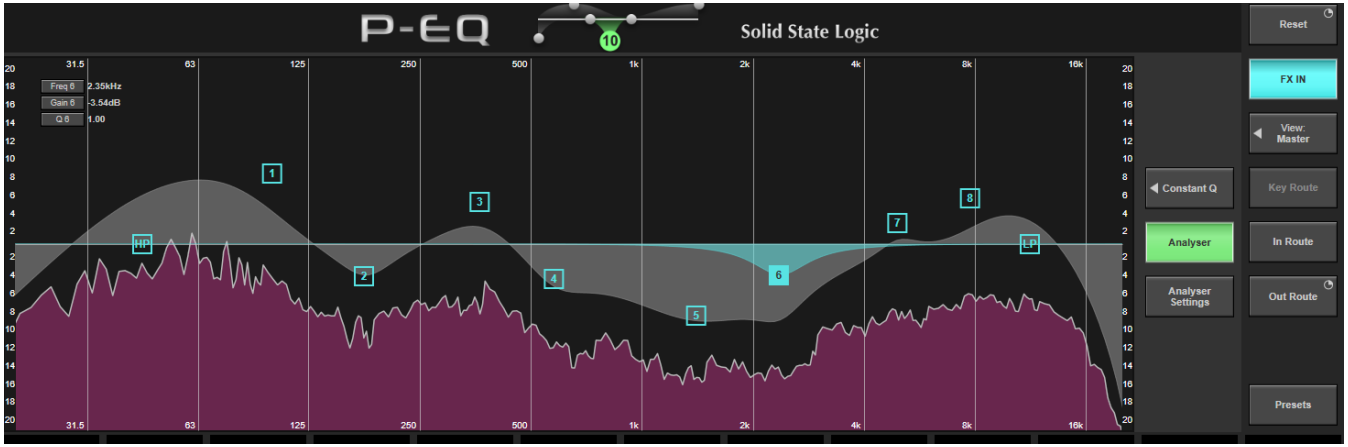
Bus Compressor Improvements

The legendary SSL Bus Compressor in the Effects Rack has been updated with a high-pass filter in the sidechain, improved performance at high gains and a classic analogue-style gain reduction meter. The gain reduction meter is shown in the detail view of the Effects Rack, the path insert, and the channel tile on S500 and S500m.



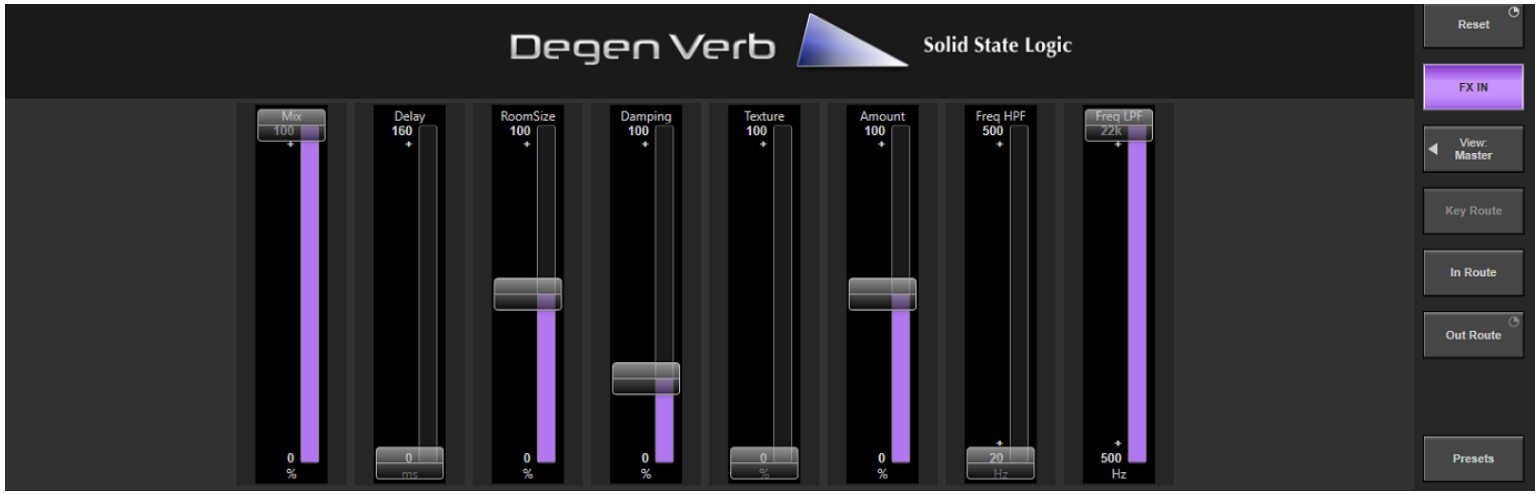
10 Band Parametric EQ

A 10 bank parametric EQ has been added to the Effects Rack, providing a highly precise EQ tool. The FFT analyser previously available on channel and bus paths is also available in both the 6 and 10 band P-EQ.



Degen Reverb

The new Degen reverb allows you to exaggerate the rate at which the signal degenerates into noise.



Scene Automation GUI Improvements

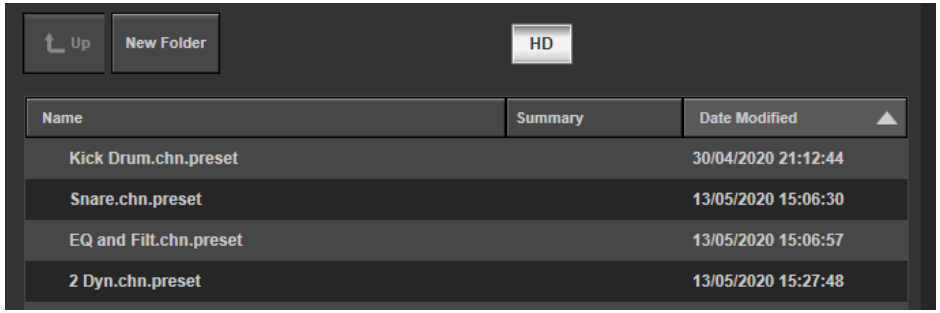
Maximise cue list visibility with a new **Show Details** option in **Scene View.** The detail view can now be hidden, doubling the number of scenes displayed.

A new **Hybrid** mode combining parts of **Concert** and **Theatre** modes. In **Hybrid** mode, the Scene Up/Down arrow keys act like **Concert** mode; pre-selecting scenes in the list ready to fire with the Go key. This allows operators to easily navigate to out-of-order scenes if required. However, whenever the active scene is selected, the Go key acts to select and fire the next scene in the list (as in Theatre mode), allowing a single key to fire sequential scenes.

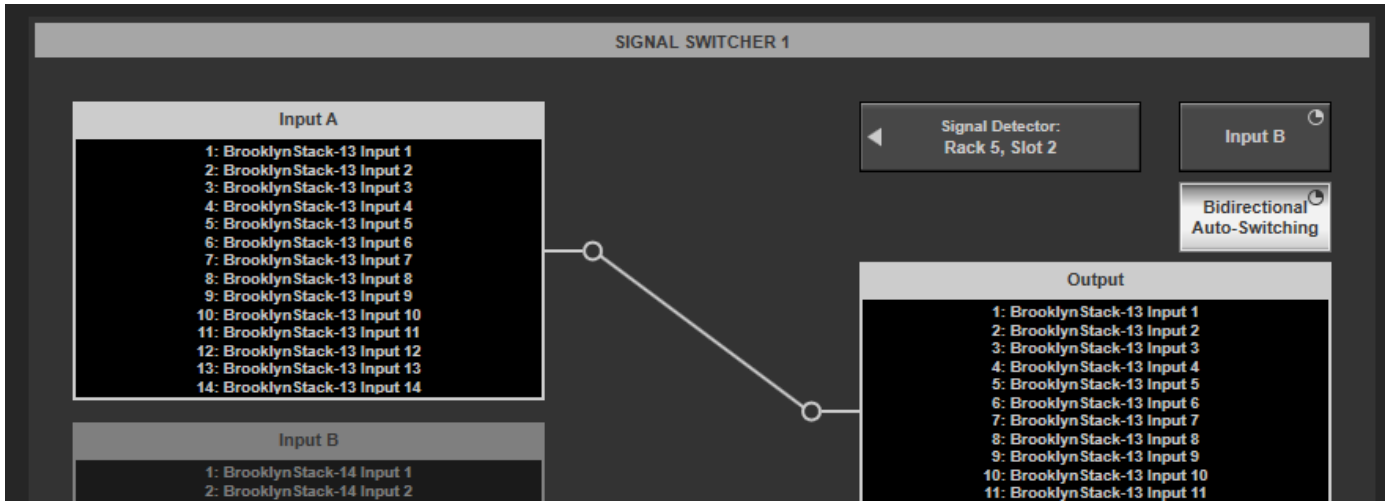
Lock all scenes can now be toggled on and off while retaining underlying individual scene lock states.

File Browser Sort

Ability to sort files alphabetically by name or by date modified. Selecting the column heading will sort by the chosen field, selecting again will toggle between ascending and descending as indicated by the arrow.



Signal Switcher Enhancement



A **Bidirectional Auto-Switching** option for the Signal Switcher now allows the Signal Detector effect to automatically switch back to the A inputs if the control signal returns above the defined threshold (manual control was previously required to return to A). The Signal Detector features glitch detection when Bidirectional Auto-Switching is engaged to prevent the Signal Switcher flip-flopping between A and B inputs if an intermittent control signal is detected.

The new mode caters to playback devices that cannot output a reference signal when not in playback mode. When playback is stopped, the Signal Switcher will switch to the B inputs, but return to the A inputs as soon as playback is restarted under normal (non-fault) conditions.

Other Features and Improvements

- Increased Detail View page selection button and font size
- Theta pan elevation GUI shows width
- Shure ANI4IN control support
- Auto backup to USB device during update – see install notes information
- Updated Dante API (v4.2.2.4)
- Updated Ember+ SDK (v1.8.2)
- Set Time Zone from the console GUI
- Restart Comms button for production automation in Setup | Options | PA | Settings
- Automix Slave depth displayed as %
- Manufacturer and Model ID differentiation for control of supported 3rd party Dante I/O devices
- DLE option for UDP TSL UMD

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Document Revision History

Final Draft	Tom Knowles	1st Feb 2021

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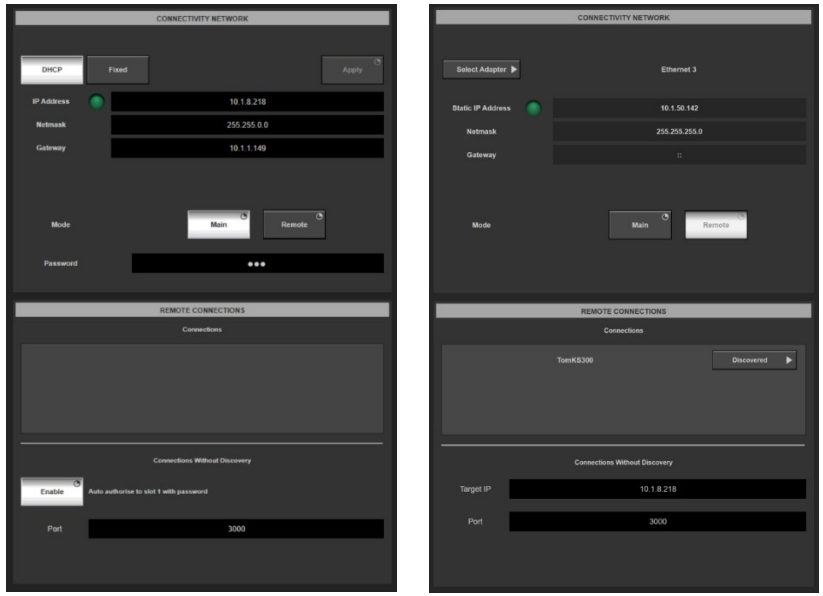
Introduction

This document covers the features of System T V3.0.26 control software release. Update instructions are provided in a separate document. Note V3.0.26 is a minor release on the V3.0 branch, please see previous V3.0 release notes for details of other features added in V3.0.

Features

Remote Connectivity Without Discovery

To enable “Remote” and “At-Home”, decentralised and distributed productions across VPNs, the remote connection option has been expanded to provide **Connections Without Discovery**. When using consoles and T-SOLSA on a LAN or L3 routed network, the remote client discovers the main audio control server via an inbuilt discovery service. This new addition allows connections in cases that the discovery service cannot be easily routed, e.g. VPNs.



A **Target IP** of the machine set as **Main** host that runs **Audio Control Server (ACS)** is entered at the software running in **Remote** mode. The **port** used is manually set for the connection without discovery, both the remote client and main server port must match. At the Main host ACS an option to Auto authorise to slot 1 with the password has been added. This allows a remote connection to be established without the need to accept the connection at the main host. Remote without discovery settings can be restricted from **Access Control**.

As with all remote connections on System T, the front panel in remote mode is restricted from Console Config, Showfile management and Power off. These operations must be managed by a person at the main ACS control position, or via TeamViewer into that machine.

- **TeamViewer** provides the tools to operate the main ACS remotely, useful for technical support or configuring the system and showfile
  - Not for operation mixing use – hardware tiles cannot be used across TeamViewer
- **Remote Connectivity** provides additional control positions on 2 slots for operational use – can provide hardware controls

External Monitor Source Labelling

All external source selectors (**External 1**, **External 2**, **Studio Monitors to 1-4**) include the ability to rename each source slot with a user label. This label is stored for the slot and is maintained if patch routing to the source sector is changed. If no user label is entered the external selector will inherit the physical name from the I/O. The user labels will show on the relevant OLEDs when that source is selected on S500 and S300 surfaces.

Overview Zoom

Overview app includes a **Zoom** function that takes the display from 16 banks of 16 paths (256) to 4 banks of 16 paths (64). **View Select** options provide navigation across the greater numbers of pages available in zoom mode.

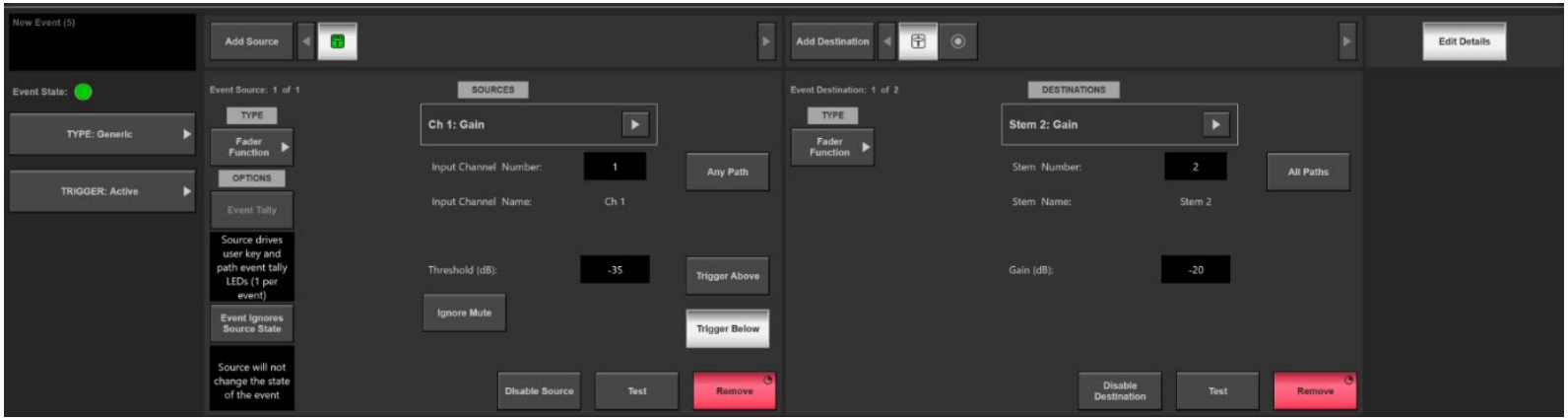
Loudness History on Meterbridge (S500/S500m)

Ability to show the 30s history meters from the loudness effect rack module in a 4x2 meterbridge slot.

Events Manager Additions

Fader Position Functions

A new source option **Fader Function** allows **Events** to be triggered when a specific (or any) path fader exceeds or falls below a user-defined gain value. The **Ignore Mute** function allows the option to include or exclude the Mute switch state in the Source's threshold logic.



Similarly, a new **Fader Function** destination type allows path faders to be driven to a specific gain value when an Event is triggered.

Fader Function events sources can produce similar functionality to **Fader Open** and **Fader Closed** events sources, but assignment to channel or bus is from the Event Manager GUI and more appropriate for triggers permanently tied to a specific path. Fader Open and Closed events are established in the **Event Manager** but assigned from **Channel View**, allowing the user to easily change path assignment if necessary.

Note: The source fader function is affected by any VCA control and uses the audio fader position (shown by the blue bar on CV meter) to trigger the event source. The destination function acts on the path fader and is applied post VCA.

Source, Destination & Event Disable

Individual Event Sources and Destinations can now be disabled using the **Disable Source** and **Disable Destination** buttons in each Source/Destination interface (see example above). This allows specific Sources and/or Destinations to be temporarily excluded from an Event's logic, without the need to completely remove it from the Event and consequently lose its configuration and routing.

Similarly, entire Events can be disabled using the **Disable** button in the Event Manager sidebar. The sidebar and events list now include multi edit functionality. Disabled events show as dulled in the event list and have a red indication in the enable column.

Source & Event State Indication

Individual Event sources that are active are now indicated by a green icon in the Event list and detail areas. Similarly, the overall Event state is now also indicated. These provide clear visual indication of source and Event active states.

New Events Functions

Additions include: Path **AFL** and **PFL**. **Showfile** and **Scene Save**. **Arm/Disarm all Input** or **Output** actions for scene automation.

Scene Automation Additions

A trigger **At** option is available for each scene automation output action, to set the action to fire at the **fade start**, **fade end** or **scene end** (i.e., when leaving the scene).

Four momentary push buttons: **Arm All Input Actions**, **Disarm All Input Actions**, **Arm All Output Actions** and **Disarm All Output Actions** are available in the **Automation Controls** detail area. These act as a macro to engage the **Arm** buttons on all configured **Input/Output Actions** across all scenes (not just the selected/active one).

Other Features and Improvements

- Improved Channel View redraw
- Spectra-lyser FFT GUI can be displayed on the S500/S500m meterbridge in 6x3 and 8x4 slot sizes
- KVM functions cannot accidently be assigned to channel view user key popout

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Document Revision History

V1 - Initial Version - V3.1.24	Tom Knowles	20th Aug 2021
V2 - Updated for V3.1.25	Tom Knowles	13th Oct 2021
V3 – Updated for V3.1.27	Tom Knowles	30th Nov 2021

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Introduction

This document covers the features of System T V3.1.27 control software release. Update instructions are provided in a separate document.

Features

Send Stems

Send Stem mode allows the standard subgroup (on/off) type stem to be switched to a bus with a send level per contributing path. Channels or other stems can contribute to stem busses, both contributing path types include the additional send features.

V3.1 increases the formatted stem count from 32 to 64, the showfile configured stem count uses mono equivalent stem resources available for the target hardware and sample rate (e.g., 80 @48kHz on T80). The **Channel View** Stem and Master **Detail Views** are split into separate GUIs to accommodate 64 stems and a send fader without a need for paging.

Send Stem mode can be useful for efficient effect return signals (e.g., reverbs) or discrete feeds to outputs that require an independent mix (e.g., speakers). Additionally, when in send stem mode, the contributing path includes a pre fader, post all switch for the send.

Stems default to Subgroup mode to maintain the existing functionality and usage. Send Stem mode is enabled per stem via the **Console Config** GUI. To change mode the console config must be edit enabled and changes applied.

Send stem controls are available from within the main **Channel View** and **Detail View**.

Within the detail view the selected stem will show a send fader, 0dB switch and feed point selector if Send stem mode. **Follow Detail** maps bus routing and send level to hardware controls for the selected contributor and bus. The bus routing GUI button shows the send level and pre fader / post all pick off point. A stem left in subgroup mode does not show these additional GUI elements for clarity and simplicity.

With Stems selected in the Channel View upper context area, stems in send mode show level, and pick off point (again subgroup mode stems retain the simplicity of an on/off GUI). The selected stem send level for all 16 visible paths is mapped to the quick encoders for hardware control and can easily be flipped to faders for precision adjustment of a specific stem mix.

CH 001 0.00dB Ch 1
CH 002 0.00dB Ch 2
CH 003 0.00dB Ch 3
CH 004 0.00dB Ch 4
CH 005 0.00dB Ch 5
CH 006 0.00dB Ch 6
TRK 001 0.00dB Track Bus 1
MM 001 0.00dB Mix Minus 1
VCA 001 VCA 1
AUX 001 0.00dB Aux 1
STM 001 0.00dB Stem 1
STM 002 0.00dB Stem 2
MST 001 0.00dB Master 1
MST 002 0.00dB Master 2
Stem 1-8
Fader
Master
Track
Stem
Mix-
Aux
Assigned
Reverb 1
Gain
IN

Channel View Scene Automation Recall Safe Processing Blocks

The **Path Recall Safe** feature is extended to include individual path processing blocks. Providing a quick and simple way from within the **Channel View** to recall safe a particular path section when firing scenes.

The Channel View **Recall Safe** features will override the **Scene Automation** recall filters. If a path or an individual section is in recall safe, a scene fire will not change the parameters regardless of the scene automation filters settings. If a path or an individual section is NOT in recall safe, a scene fire will observe the scene automation filters, both global and scene mode.

The existing **Path Safe** feature (enabled from the channel strip "camera" button – press and hold) acts as a "top level" safe. This completely excludes a path from scene automation recall and is applied to entire paths on a path-by-path basis. The "**camera**" button shows dark purple (originally light purple) when a path is in recall safe. On System T path safe and this new processing block safe are stored in the showfile. (Tip use **Path Link** to engage safe on multiple paths simultaneously.)

Recall Safe can be applied to individual sections of a path, e.g., only the Fader and EQ, leaving the other sections to be recalled through the more granular automation filters.

Recall safe can be enabled on the following path processing sections:

- Input (Gain, Trim, etc)
- Fader & Mute
- EQ & Filters
- Pan
- Dynamics 1
- Dynamics 2
- Delay

To enable Recall Safe on a section, the Channel View page must be put into **Edit Safe** "shift" mode. This must be assigned to a **User Key** to activate, e.g. the User Keys pop out in the Channel View or a hardware user key.

Engage the **Channel View Edit Safe Mode** with the user key. The Input section (top of path strip), Fader, EQ, Pan, Dyn1, Dyn2 and Delay buttons in the Channel View will turn light purple to indicate they are recall safe editable.

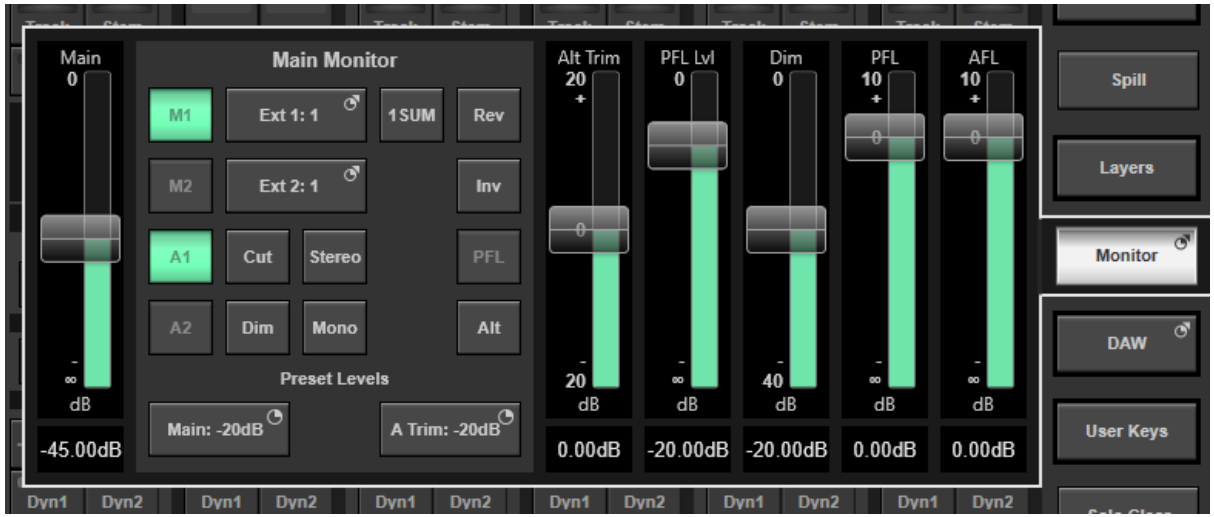
Press these buttons to engage Safe mode on the desired section of processing (Path Link can be used to modify multiple paths simultaneously). A dark purple triangle will be shown in the top left corner to indicate **Safe Mode** is active on that section, the section parameters will **not** change state when automation scenes are recalled. This dark purple recall safe indication is repeated in the detail view for the selected path.

The Detail View and Quick Controls will continue to operate as normal while in Channel View Edit Safe mode. Double tap the context area towards the middle of the path strip or the Eyeconix area at the bottom of the path strip to open the Detail View to make processing changes while in Edit Safe mode.

Disengage the **Channel View Edit Safe Mode** with the User Key when you have finished editing Safe states.

Monitor level Numerical Entry and Presets

All the monitor and studio monitor levels within the monitor pop out now feature a numerical display and keyboard entry. Double tap to enter a dB value with a keyboard.



The current **Main** and **Alt trim** (or **Alt absolute** – in Alt Isolate level mode) levels can be stored and later quickly recalled with **Preset Levels**. Press and hold to store current level, single press to recall. Recall can be assigned to **User Keys** or **Events** for hardware, external or macro driven control. These preset levels are stored in the showfile along with the current levels.

I/O Management improvements

System T's AoIP integration provides automatic discovery of Dante devices and SAP enabled AES67/ST 2110 streams. This allows simple AoIP routing based on the physical devices connected, with immediate discovery. These records persist within the consoles IO database to allow routing when devices are offline or not reachable. The database may also be transferred to T-SOLSA for full offline configuration.

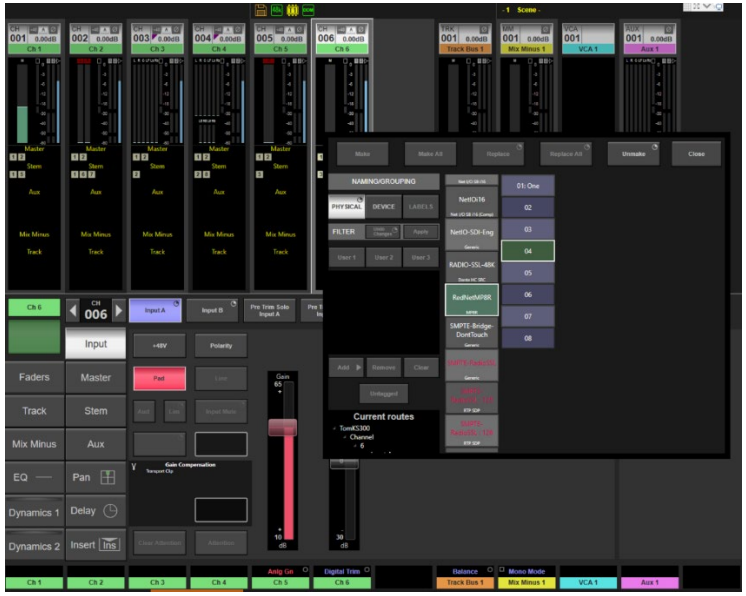
For networks that are very dynamic, and devices are frequently changed, the persistent nature can result in a large database of "offline" devices, shown in red, within the **Setup IO Management** GUI. New **Multi Select** and **Select All Offline** options within this GUI improve the experience of "tidying up" the database. Only offline or unreachable devices can be deleted.

Care should be taken when using this feature. **IO Management** can (and should) be restricted for day-to-day operations from within Access control. Note - the IO database can be exported or reloaded using the Config Load/Export feature, again it is advised this should only be used by console admin users.

Mic Control RedNet MP8R

Control of Focusrite RedNet MP8R is available from the System T software with a Rednet stagebox control licences. Please speak with your SSL sales or support representative for compatibility and licencing information.

MP8R devices show up on the network in the same way as any Dante enabled device. System T software can route individual mics immediately, but also can configure these as logical instances for managed and secure access. When routed to a console channel path mic gain, pad and phantom power are immediately mapped to the channel strip for hardware and software control. Gains and controls are stored and recalled with consoles showfiles and scenes for precise operation in fast paced productions.

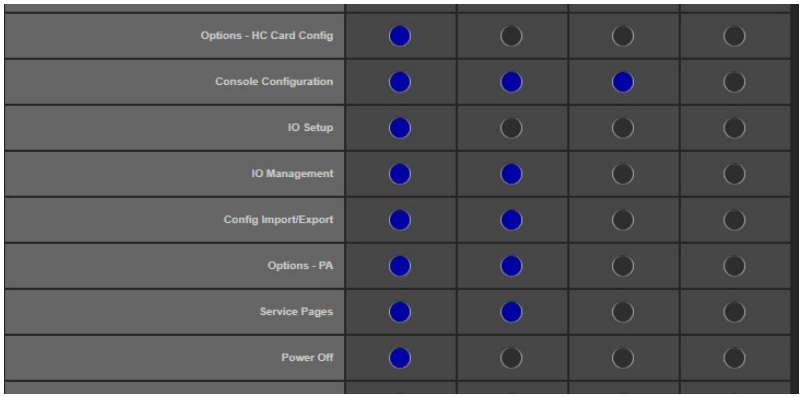


With a valid licence the device as shown in IO setup populates with controls in addition to control on channels where mics are patched. The MP8R controls have no concept of ownership, any controller (System T or Focusrite app) can simultaneously control the mic pre.

Access Control Additions

Power off has been added to Access Control so this can be password restricted if required.

IO setup control is added to Access Control to allow this to be password restricted. When restricted the GUI can be accesses, but controls of the IO cannot be adjusted unless the console/controller is the owner of that IO input.

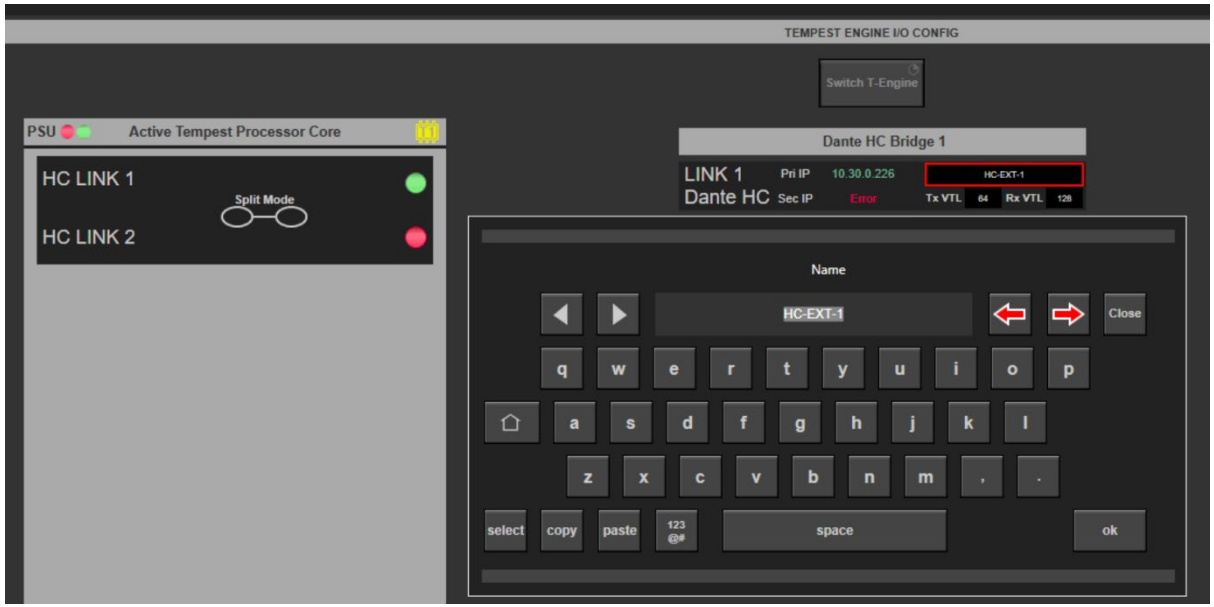


Effects Rack - LtRt Downmix

A 5.1 to LtRt Downmixer is provided in the **Effect rack.** This alternate downmixer can be used to encode a 5.1 signal in a stereo signal or used to confidence check how a 5.1 mix may be rendered on stereo devices that uses LtRt. Please note this is NOT a LoRo downmix, for LoRo please use busses or the 8-wide 2.0 DownMixer Effect tool.

HC Config GUI and ACS Record of Tempest Engine Config

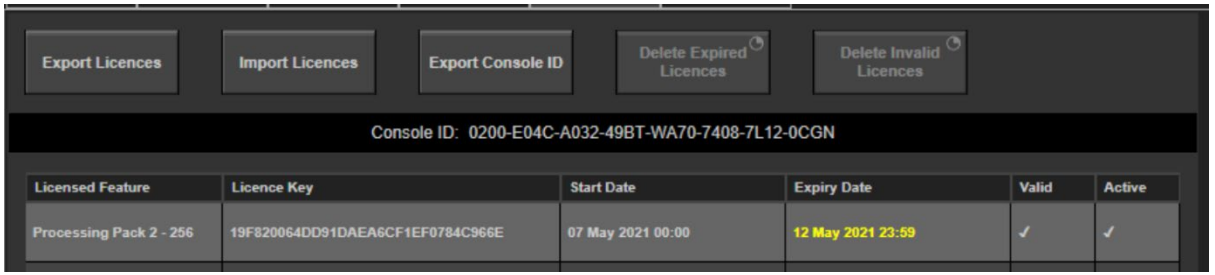
The Tempest Engine Config GUI now allows editing of the ACS' (Audio Control Server[1]) record of its HC bridge interfaces. VTL count can be configured from the GUI and can be set differently for Tx and Rx channels, providing an efficient use of resources when VTLs are heavily used in one direction (e.g., Tx signals for an external control system).



[1] ACS – Audio Control Server – In most cases this is the console or TCR. However, the distinction is important. Console controllers use the concepts of main (running ACS), member and remote, plus active, and dormant instances are possible. The ACS is the software that holds, stores, and recalls all the stateful information and configuration files related to the console's functions.

Licencing Management Improvements

Console ID is now exportable and visible from the **Service Licence Details** GUI. This provides a single 32-digit identifier to validate licences for this console control surface. The licences scheme has shifted to a v2 version.



Licences now have both start and end dates, they can be created with future start dates - allowing short term rental licences for use at a single event. Licences can now be truly perpetual, displaying no start or end date.

A selection of warnings is included to alert users to expiring and expired licences. For licences that cover features that are determined at boot (e.g., Path Processing Capacity) the current path count will persist until a reboot, at which time the largest valid licence for the currently connects engine will be observed.

There are 3 scenarios that will prompt alerts to the user:

1. Console has licence(s) that is(are) no longer valid – status bar icon - This will stay visible until the licence(s) are deleted.
2. Licence will expire in x days – persistent status bar message shown - 5, 4, 3, 2 and 1 day – Expiry date shown in yellow in the licence GUI.
3. Licence has expired – If the consoles is turned on at the time the licence expires (midnight) a popup appears stating the licence has expired - Expiry date shown in red in the licence GUI.

A license web portal for storage and retrieval of your consoles' licenses is in development. This will be released later in 2021.

V3.1 also includes support for future TE1 and TE2 tempest processing engines. These engines can be configured with processing packs P1 to P5 for a range of path sizes. More details later in the year.

Network Adapter Selection

A full reimagining of network adapter assignments on the console software, allows the commissioning engineer or admin user to choose what NIC to use for which service. This allows console services to utilise the same network adapter, potentially reducing the number of networks required and allowing deployment in enterprise routed networks.

A **Network** GUI is available in the **Service** menu. Changes can be restricted using **Access Control**. The network settings of the 6 adapters can be configured, adapter selection for each service is chosen in the lower part of the GUI. The GUI to manage **Surface Remote Connections** is retained in the **Setup Options** page.

This flexibility can come with complexity. In some cases, it is preferable to stick with the factory default assignments with each function mapped to a dedicated network.

Where L3 routed networks are being utilised, the default gateway on the control surface is required to ensure packets reach the router. Use cases exist where multiple console services require L3 routed networks. E.g., Production Automation, Connectivity access over a VPN, a DDM instance on a different subnet. The console can now use the same network for all these services.

A software update or keep install will retain the previous adapter assignments based on physical NIC location on the machine. A flat install erasing data will take the SSL original assignments, based on physical NIC location in the machine.

After updating to v3.1 if adapter assignments are changed, a restore with a back made in v3.0 or earlier will not result in the correct assignments. A new backup should be taken after the v3.1 update.

For S500 surfaces with a meterbridge, the surface network must remain on the original default adapter due to internal console wiring. If this service and others need to utilise an adapter with a default gateway, the services must all be assigned to this adapter.

Other Features and Improvements

- Each Event can now have multiple Scene Automation Input and Output Actions as event sources and destinations.
- Drive letters are included in file browser (useful for T-SOLSA with multiple/networked drives).
- New Eyeconics: AMBEO™ Mic, Diagonal Arrows, UK four country flags.
- Long path names on meterbridge are truncated and compacted.
- Status message when dynamic dual main routing is full.
- Status message and routing GUI update when a console made routing subscription on Rx channel of external IO device is removed by another controller.
- Console Rx dynamic dual domain routes are remade when console sees they are removed by another controller.
- Console routing GUI updated when external IO devices become reachable again, changes made to device Rx subscriptions while unreachable are now reflected on the console routing GUI
- HC card name in surface to engine config can now display up to 31 characters, the maximum the device can have.
- Dante devices with specific drivers use both manufacture and model ID
- Improved data storage when T-SOLSA used with windows user accounts
- Improved handling when importing large IO database in T-SOLSA.

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V3.2.8 Feature Release Notes

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E&OE

Document Revision History

V1 - Initial Version - V3.2.8	Tom Knowles	2nd March 2022

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Introduction

This document covers the features of System T V3.2 control software release. Update instructions are provided in a separate document.

Features

Reduced Metering Data Bandwidth

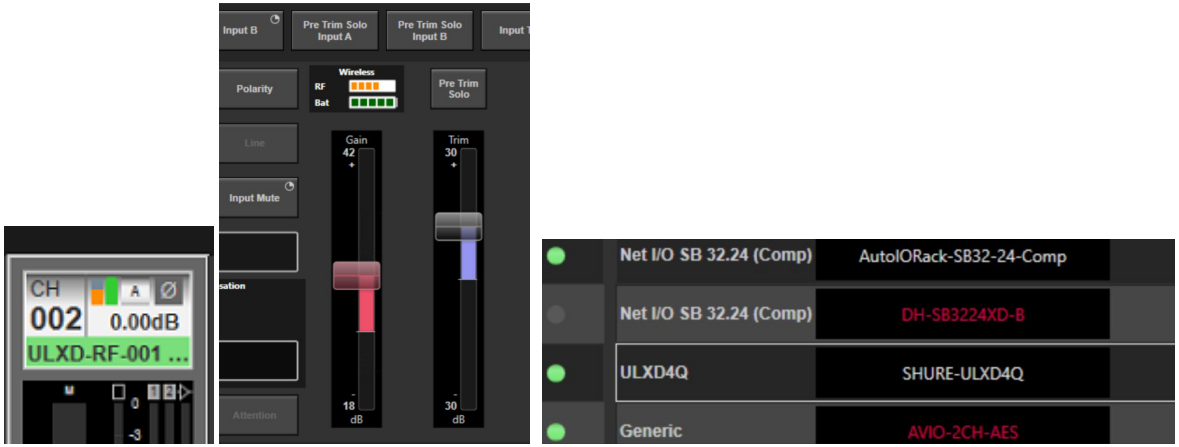
The networking code has been rewritten to produce a significant reduction in the bandwidth required for metering on remote connections. This removes some technical barriers to remote console control, especially over VPN connections. The overall bandwidth required for control data per remote connection is now less than 25 Mb/s*; within the capabilities of many ISP connections.

*Note this figure does not include bandwidth for any audio streams used for remote monitoring; this will be dependent on the service/technology used.

Control of Shure ULX-D and Axient Wireless Mics

Providing enhanced interoperability through software updates is at the heart of SSL broadcast and System T. Gain and mute control of Dante-enabled Shure ULX-D and Axient Digital wireless mic systems is now available when routed to console Input Channels. Battery and RF status is also shown in the Channel View and I/O Setup pages. Shure ULX-D and Axient Digital wireless receivers are discovered as Dante devices and routed from as normal.

Note that only Dante-enabled ULX-D and Axient Digital products can be controlled by the console; this excludes the ULXD4 receiver (it is not Dante enabled).



With a valid licence the device as shown in IO setup populates with controls in addition to control on channels where mics are patched. The Shure controls have no concept of ownership, any controller (System T or Shure app) can simultaneously control the mic pre.

SNMP Enhancements

In addition to the previous SNMP items (Tempest engine PSU statuses, surface PSU statuses, surface NIC statuses) the surface CPU temp and disk usage are reported. "Remote" surfaces provide their own SNMP data, additional "Member" extension front panel clients report SNMP status via "Main" Audio Control Server.

Each surface on the network can also report the PSU and NIC statuses of each IO device on the network. SSL Network I/O devices report both PSU and NIC, 3rd party Dante devices report NIC status only (the PSU flag is SSL custom).

Within I/O setup each device can have SNMP enabled, allowing multi console installation to determine which controller reports which shared IO unit.
There are new MIB files to support the new features. As the IO device list is dynamic and not identical on all consoles, this feature uses a table type OID.

Recalibrate All Owned Net I/O Mic Inputs

The ability to recalibrate all Net I/O (SB 8.8, SB i16, SB 32.24 and SB 16.12) mic inputs owned by a System T console is now available from the User Key system (as a press & hold action) and the Event Manager. This negates the need to go through each channel individually and recalibrate the gain compensation on the compensated split outputs of these devices.

Change I/O Device Sample Rate from Console

To streamline setup, it is now possible to set the sample rate of each connected Dante device from the console GUI. This allows users to configure most devices without the use of Dante Controller.

For SSL Net I/O devices, the console must Own the stagebox to change the sample rate. For generic Dante devices that do not support the concept of SSL ownership, the sample rate control is always available when the device is online.

Some Dante devices require a soft reboot when a sample rate change is requested (e.g. SSL Dante HC cards), this reboot must be initiated from Dante Controller or manually power cycled. In these cases, the console status bar reports - "This device must be rebooted from Dante Controller for the changes to take effect."

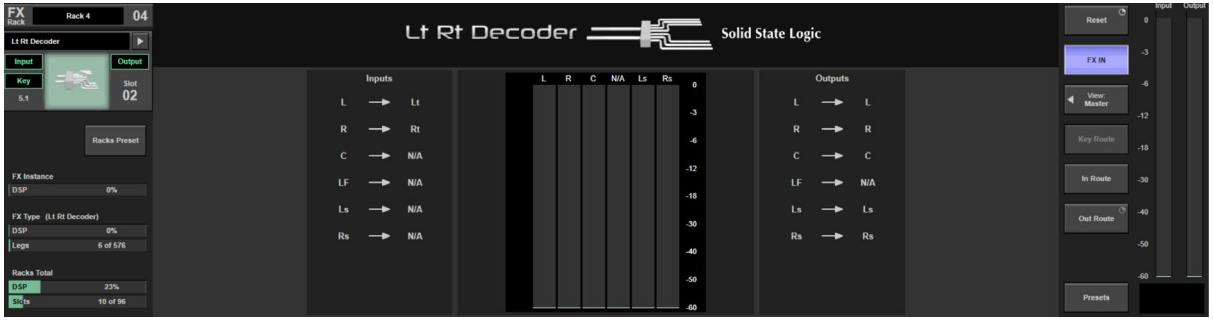
Events Manager MIDI CC (Control Change) support

The MIDI CC message format is now supported in Events Manager. These can be used to control DAWs and other third-party devices/applications that support the MIDI CC message standard.

Improved Labelling of Disabled Controls

The labelling for the Quick Controls beneath the main screen is now more intelligent and greys out when the control is disabled (i.e. when a parameter is not applicable to the selected path type). This provides clearer indication of the active controls for the currently selected path.

LtRt Decoder Effects Rack Unit



A LtRt to 5.1 Decoder is provided in the Effect rack. This can be used to confidence check how the LtRt Downmix encoder is performing.

Network Adapter Names

The surface Network Adapters are shown in a deterministic order, based on physical location on the external surface – E1 to E6. The connection names are those given by the Embedded OS at installation.

Other Features and Improvements

- GPIO logicals are now enforced to be individual and never with audio logicals
- Access Control additions: Sample rate, Model ID (Tempest Engine Capacity settings)
- Status bar message if Meterbridge import differs between console and file (S500 only)
- To ensure correct operation with the underlying OS only network adapters with active connections can be edited
- Additional “Member” extension front panel clients report SNMP status via “Main” Audio Control Server

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V3.3.12 Feature Release Notes

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Document Revision History

Initial Version	Berny Carpenter	2nd August 2023

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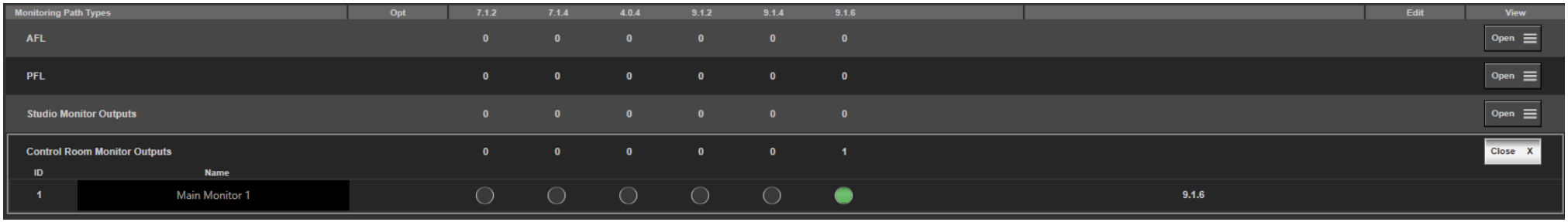
Introduction

This document covers the features of System T V3.3 control software. Update instructions are provided in a separate document.

Features

Increased Immersive Monitoring Formats

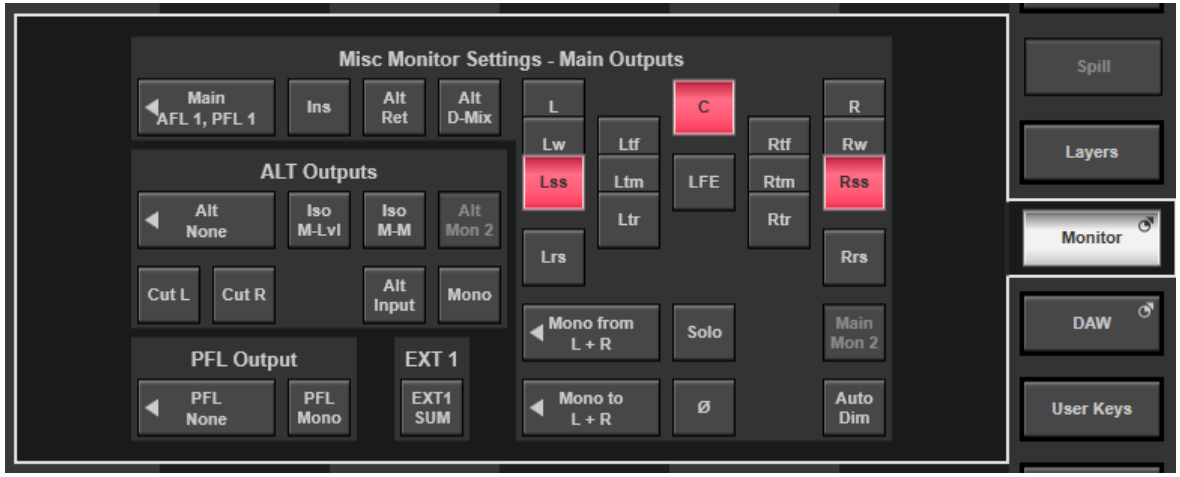


The Control Room Monitor formats now include 9.1.2, 9.1.4 and 9.1.6. These formats are for use with the Dolby Atmos Renderer. The additional formats include Left Wide (Lw) and Right Wide (Rw), matching the default renderer channel mappings.

Output	9.1.2	9.1.4	9.1.6
1	L (Left)	L (Left)	L (Left)
2	R (Right)	R (Right)	R (Right)
3	C (Centre)	C (Centre)	C (Centre)
4	LFE (Low Frequency Effects)	LFE (Low Frequency Effects)	LFE (Low Frequency Effects)
5	Lw (Left Wide)	Lw (Left Wide)	Lw (Left Wide)
6	Rw (Right Wide)	Rw (Right Wide)	Rw (Right Wide)
7	Lss (Left Side Surround)	Lss (Left Side Surround)	Lss (Left Side Surround)
8	Rss (Right Side Surround)	Rss (Right Side Surround)	Rss (Right Side Surround)
9	Lrs (Left Rear Surround)	Lrs (Left Rear Surround)	Lrs (Left Rear Surround)
10	Rrs (Right Rear Surround)	Rrs (Right Rear Surround)	Rrs (Right Rear Surround)
11	Lts (Left Top Surround)	Ltf (Left Top Front)	Ltf (Left Top Front)
12	Rts (Right Top Surround)	Rtf (Right Top Front)	Rtf (Right Top Front)
13		Ltr (Left Top Rear)	Ltm (Left Top Middle)
14		Rtr (Right Top Rear)	Rtm (Right Top Middle)
15			Ltr (Left Top Rear)
16			Rtr (Right Top Rear)

The three new formats gain all existing System T monitor features, including:

- Individual level and delay control per output channel on both Main Out 1 and Main Out 2
- Two 24-way external source selectors
- Logical device creation



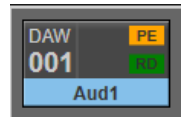
If using **Dual User** monitoring mode it is now possible to configure **Main Monitor 1** in formats using up to 10 channels (e.g. 5.1.4 or 7.1.2). **Main Monitor 2** can be configured in formats up to 6 channels (e.g. 5.1).

Control of Dolby Atmos Object Pan Position

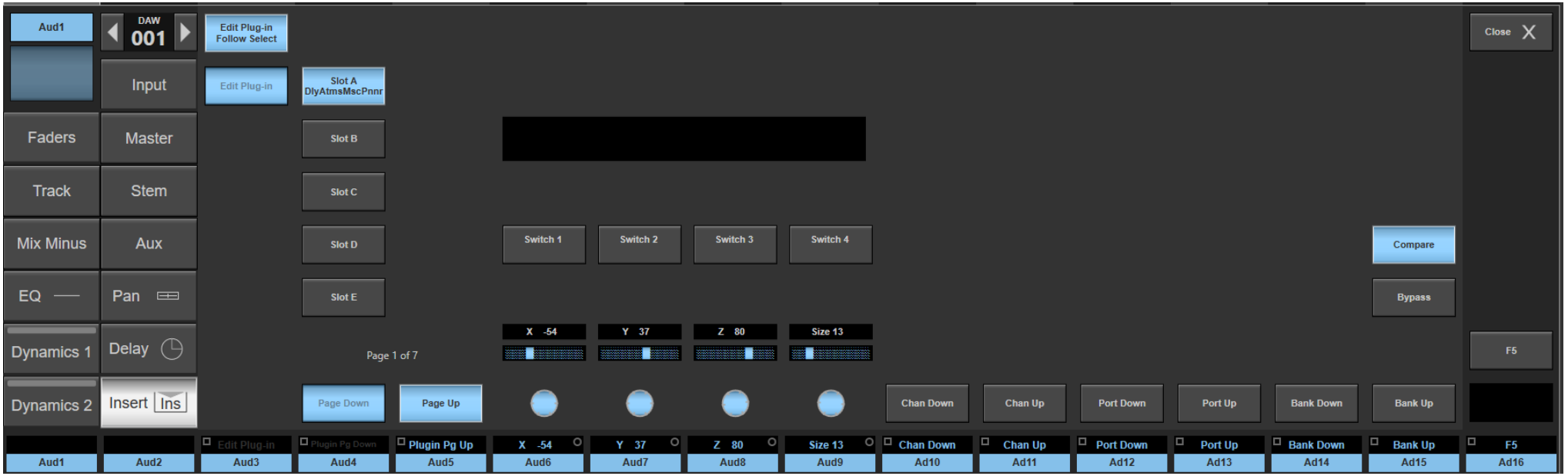
The position of Dolby Atmos object information played to a Dolby Atmos renderer can be controlled from the console control surface. This is achieved by controlling the Dolby Atmos Music Panner plug-in, allowing the user to record pan automation within the DAW. Quick access to *X*, *Y*, *Z* and *Size* is available from the console encoders, with additional access to other parameters within the plug-in if required.

The Dolby Atmos Music Panner is controlled from the console control surface through HUI plug-in control. Configuration of HUI plug-in control is detailed in the following section of this document.

DAW Control HUI Plug-in Control

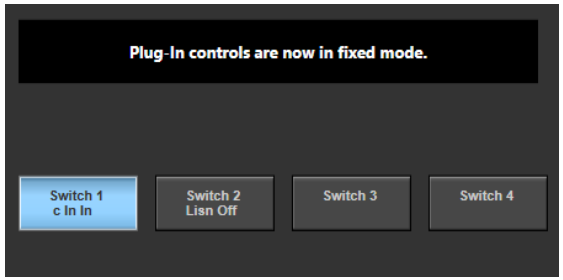


HUI plug-in control is now available in System T. Any DAW track can be easily accessed from the first 8 console DAW paths. Immediate access to 5 plug-in slots is available from the console DAW path **Insert Detail View** with control from 4 quick encoders and 4 switch functions. The DAW path with **Edit Plug-in** enabled displays PE at the top of the channel strip.



Select **Edit Plug-in** and then one of the 5 plug-in slots (Slot A through Slot E) to bring plug-in parameter control to the 4 encoders and switches. Enable **Follow Detail** to control these parameters from the associated fader tile encoders and buttons. If **Edit Plug-In Follow Select** is enabled then plug-in slot selection will follow the selected DAW path on the console, bringing the selected plug-in into focus within the DAW.

Page Down and **Page Up** access the various pages of parameters for each plug-in. Dedicated **Compare** and **Bypass** buttons enable the named plug-in features within Pro Tools. The **F5** button toggles the V-Pots between Fixed and Velocity-Sensitive modes, the current mode will be confirmed within the HUI message display window above the plug-in control parameters.



Port Down and **Port Up** have been added to the existing **Channel Down**, **Channel Up**, **Bank Down** and **Bank Up** DAW channel navigation options. **Port Down** and **Port Up** shift the selected DAW channels in increments of 8, making it simple to reach the desired DAW channel within the first HUI bank as required for Pro Tools HUI plug-in control.

Refer to the System T Operators Reference Manual or System T V1.8 Feature Release Notes for further information on System T DAW control.

Rehearsal Group Enhancements

System T now includes 8 rehearsal monitor control groups (previously 4). These can now be labelled, easing path assignment during show configuration. The rehearsal groups allow playback of recorded audio through the console channels, enabling engineers to test the system or performers to rehearse alongside previous performances. There are eight possible rehearse switching groups, allowing different sets of channels to be switched when necessary.

Rehearsal group configuration is available from the **Menu** | **Setup** | **Options** | **Path** tab under **REHEARSE MODE**. The groups can be named with a double tap of the text box. Each group has an associated colour used to identify the switch group state, both per channel strip and in the status bar. Individual **Rehearse** buttons (press and hold to activate) enable or disable each rehearsal group.

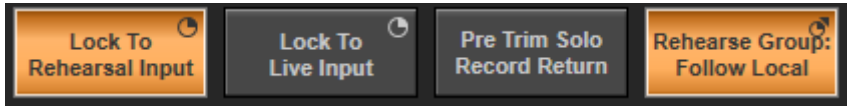
A **Global Rehearse Mode** button (press and hold to activate) switches all paths in **Follow Global** or a **Follow Group** mode (not **Follow Local** mode) in and out of Rehearse mode simultaneously.

Group and Global Rehearse Mode functions can be assigned to **User Keys** and may also be accessed through the **Event Manager**.

From the **Input Channel Detail View** press and hold **Rehearse Group** to allow the selected path(s) to be configured as:

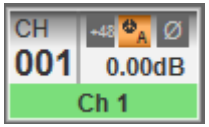
- **Follow Local** – the default option. The path is **not** assigned to a rehearsal group, the input defaults to the live input but can be locally switched to the rehearsal input.
- **Follow Global** – the path is **not** assigned to a group but **does** switch when **Global Rehearse Mode** is enabled.
- **Follow Group <*N*>** – the path is assigned to the selected rehearsal group.

The **Rehearse Group** button will light when the rehearsal input is active. If the selected path is part of a rehearsal group then the light will follow the colour of the selected group.



Additional **Lock to Rehearsal Input** and **Lock to Live Input** options provide override functions to force a path to the rehearsal or live inputs. If either of these options are enabled for a path then the selected path's input is **not** changed by rehearsal group or global switching. They provide a fast way to overcome unforeseen circumstances, such as a malfunctioning instrument or a musician not being present for a soundcheck. Switching the affected channel allows the show or rehearsal to continue while it is resolved.

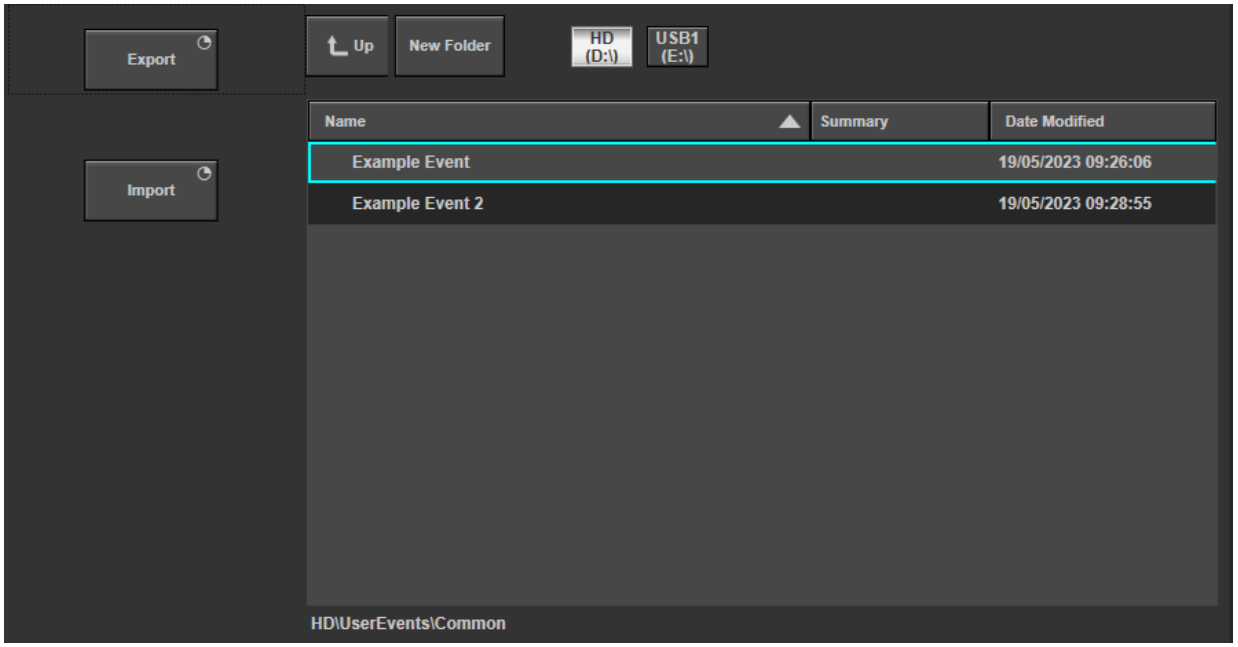
Lock to Rehearsal Input is orange when engaged (press and hold to activate), with the Channel View path input indication shown in orange when locked to the rehearsal input. **Lock to Live Input** is white when engaged (press and hold to activate), with the Channel View path input indication remaining white.



Turning on either **Lock to Rehearsal Input** or **Lock to Live Input** will cancel the other (if enabled). Turning off either mode will **not** enable the other. The **Lock To** functions can be used at any time, including when a path is in **Follow Global** or **Follow Group** mode. **Lock To Rehearsal Input** and **Lock To Live Input** states are not saved in showfiles or scenes.

Event File Manager

The System T **Event Manager** now has a file manager, enabling events to be moved between showfiles and consoles. **Event File Manager** is accessed from the **Event Manager** sidebar (press and hold to access). User access to the **Event File Manager** can be controlled using **Access Control**. As per any new function added to Access Control, **Event File Manager** will only be enabled by default for the Admin user.

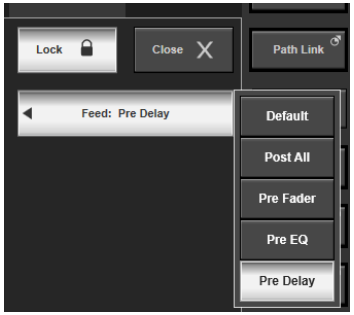


Individual events selected in the left window are highlighted and can be imported to the showfile event list. When an event is imported into a showfile it will be disabled by default. If the event needs to be reconfigured for the particular showfile or console it can be edited before being enabled. Any GPIO or MIDI event routing must be remade from the I/O available to the console. If an event already exists with the same name then the imported event name will be appended with a number.

The **Edit** column within the showfile event list allows multiple events to be selected. All selected events can then be exported to the selected location, including local console storage or an external USB device.

Pre Delay Aux Send

An additional **pre delay** aux send feed point is now available. This takes the signal from the contributing path prior to the position of the delay block, wherever it is positioned within the contributing path.



The **pre delay** aux send feed point is available as the default send position for each aux bus from the **Console Configuration** page.

External Dim

External Dim adds an additional level of logic to the Main Monitor Dim functionality. **External Dim** allows external equipment to control Main Monitor Dim without inter-cancelling the main **Dim** function. **External Dim** is available as a function for **Main Monitor 1** and **Main Monitor 2** within Event Manager.

Dim, **External Dim** and **Auto Dim** can all activate Main Monitor Dim. The colour of the Dim key shows which of the Dim functions has activated it:

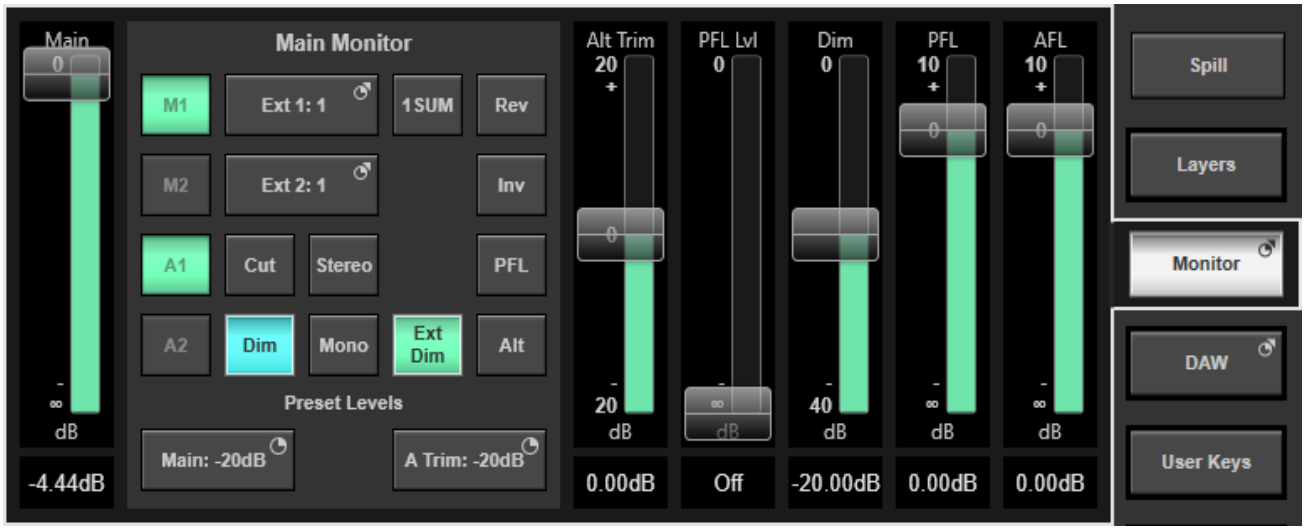
Dim control activated using Main Monitor Dim function.

Dim control activated through **External Dim**.

Dim control activated through **Auto Dim**.

If more than one Dim level is active the colour then Main Monitor Dim (green) takes priority, followed by **External Dim** (blue).

External Dim is shown in the Main Monitor pop-out and can be manually switched from here:

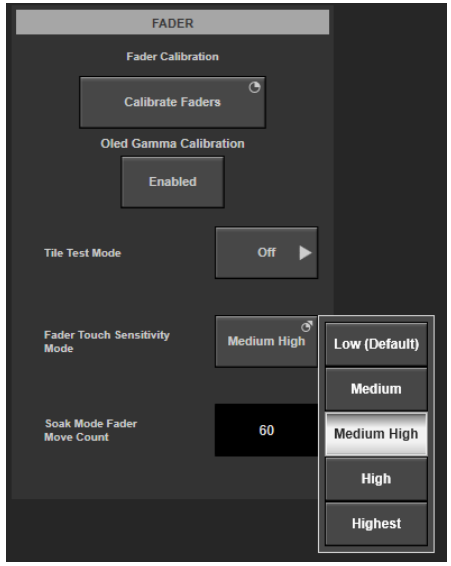


External Dim state is not stored within showfiles but will be turned off if active when a showfile is loaded. This prevents **External Dim** becoming stuck in an enabled state in showfiles which don't have an Event linked to **External Dim** functionality.

S500 Fader Tile Touch Sensitivity

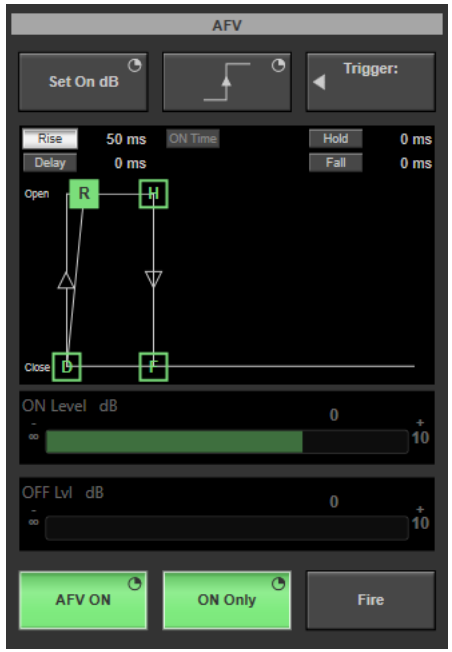
S500 fader tile touch sensitivity can now be adjusted from the **Setup | Service | Surface** menu. This allows user adjustment in installations where touch sensitivity is affected by the physical environment, such as cold and dry environments where the sensitivity will need increasing.

This setting applies to any console using the S500 fader tile, including S500, S500m, TCR and T-SOLSA.



Audio Follow Video (AFV) On Only

A new **ON Only** function for paths under AFV control provides the ability to automatically open faders with a gradual fade-in but leave the fader open once the AFV trigger has stopped. This is activated from the **AFV** section of the Faders Detail View. **AFV ON** must also be enabled for **ON Only** to function.



Other Features and Improvements

- Assigned **Quick Load Showfiles** can now be removed through **Setup | Showfiles | Manage User Templates**
- An improved panning UI constrains objects to the centre of the X-Y, X-Z and ThetaPan elevation GUIs if not routed to surround/immersive formatted buses
- Improved memory performance reduces showfile load times
- Changes to control surface tile detection method to improve tile performance

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System T

V4.0.14 Feature Release Notes

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E&OE

Document Revision History

Initial Version	Berny Carpenter	30th January 2024

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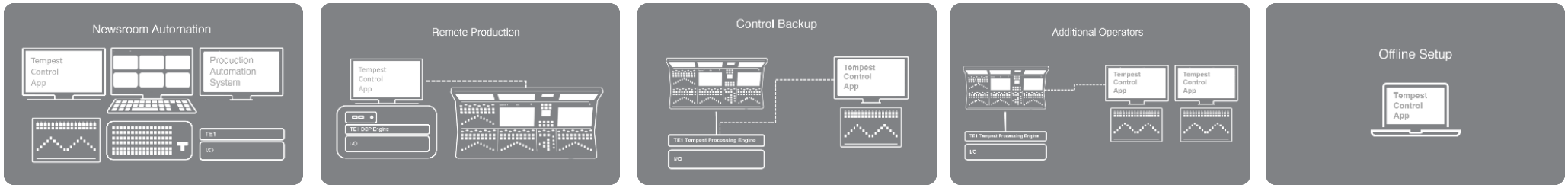
Introduction

This document covers the features of System T V4.0 control software. Update instructions are provided in a separate document.

Features

Tempest Control App



System T V4.0 incorporates the launch of **Tempest Control App**. Tempest Control App (TCA) brings the full feature-set of System T into a software application with direct control of Tempest Engines.

Tempest Control App brings further flexibility to the System T platform, providing an additional control offering for key applications including remote production, newsroom production, backup scenarios or anywhere where a physical control surface may not be required. A system which once would have required 7U of rack space can now be achieved with a 1U TE1 Tempest Engine and Mini PC, or Tempest Control App can be run in a virtual machine on a shared server.

Tempest Control App can be augmented with a fader tile and touch screen to provide physical controls. Additionally, an existing S500, S500m, S300 or TCR can remotely connect on the fly to provide large-format control from a separate location.

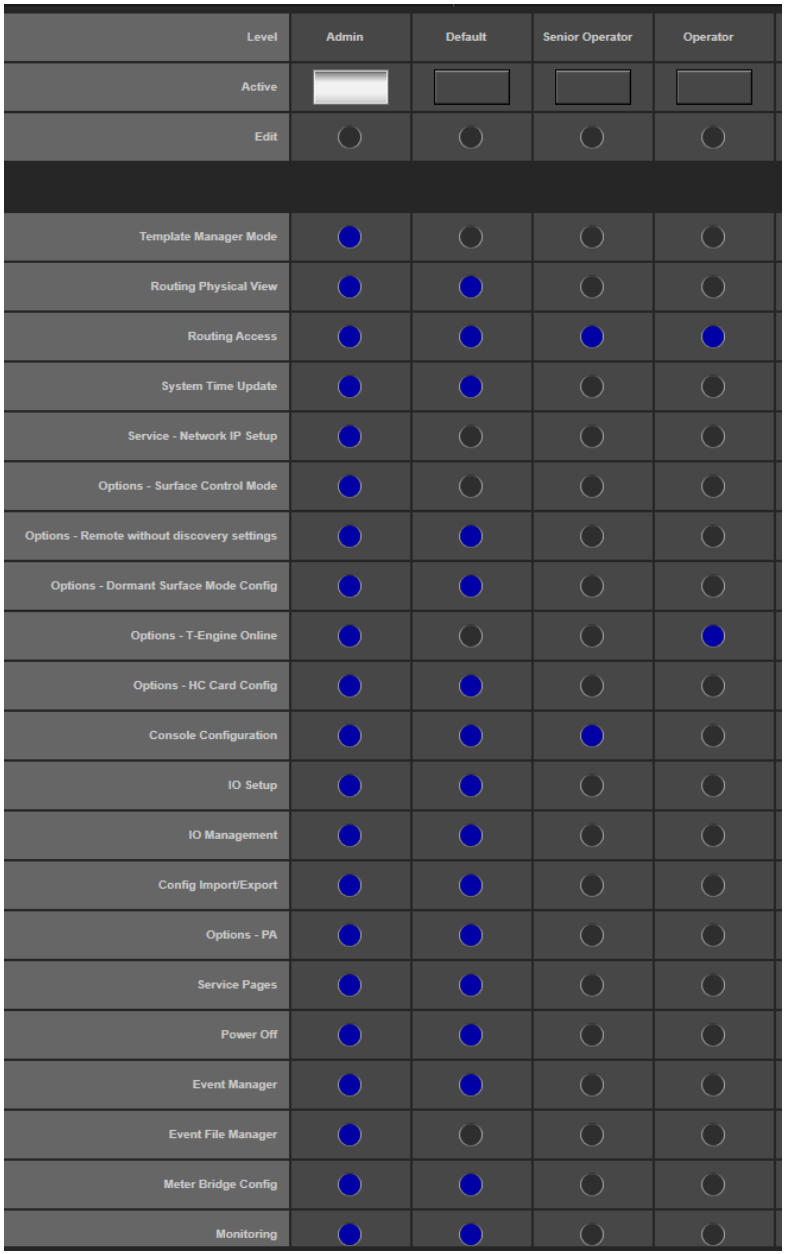
Replacing T-SOLSA, Tempest Control App will continue to be available free-of-charge for **Offline** showfile configuration and **Remote** connectivity to external control surfaces. With the optional **Online** licence, it becomes possible for Tempest Control App to directly control Tempest Engines and Dante networks. This includes the option to deploy Tempest Control App as a **Dormant Backup** control surface for existing systems.

Further Tempest Control App details are available at solidstatelogic.com or from your SSL Sales or Support representative.

Remote Surface Capabilities

Remote surfaces can now be configured to have full access to all software functions, simplifying operational requirements for remote production scenarios. The following functionality which was previously restricted is now available to every connection type:

- Console Configuration
- Showfiles
- Preset Management



Access Control Additions

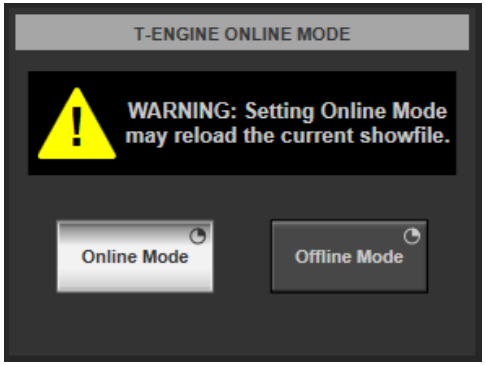
Linked to the changes for Remote surfaces, the following features have been added to the Access Control management system:

- Options – Surface Control Mode
  *Restrict the ability to change a surface (or individual FPP) from **Main/Member** to **Remote.***
  Detailed later in Member Surface Additions.
- Options – T-Engine Online
  *Restrict the ability to take a console surface **Online** or **Offline**, as required for Tempest Control App. Detailed later in Online and Offline Mode.*
- Showfiles
  *Restrict the ability to select the **Showfiles** tab in the Setup menu, allowing Load/Save/Save As actions on showfiles.*

As with previous features added to Access Control, for consoles upgrading from earlier software versions the new features are only added to the **Admin** Access Control level by default. This ensures unintended functionality is not mistakenly provided to certain levels following an upgrade.

Online and Offline Mode

System T control surfaces (S500, S500m, S300, TCR and TCA) now include the ability to take the console, i.e. the control surface and Tempest Engine(s), **Online** and **Offline**. This option is primarily for use with TCA.



When in **Offline Mode**, TCA can be used for showfile configuration or can be placed into **Remote** mode and connected to another System T control surface as an additional user position.

Online Mode is a software licenced feature for TCA. When in **Online Mode** TCA runs an active Audio Server, meaning it can connect to Tempest Engines and view and control routes on the Dante network. Full instructions on configuring TCA for **Online Mode** are available on the SSL Support website.

Hardware System T control surfaces (S500, S500m, S300 and TCR) all include **Online** and **Offline Mode** switching, no software licence is required.

Control of **Online** and **Offline Mode** switching has been added to Access Control so that access to this feature can be restricted.

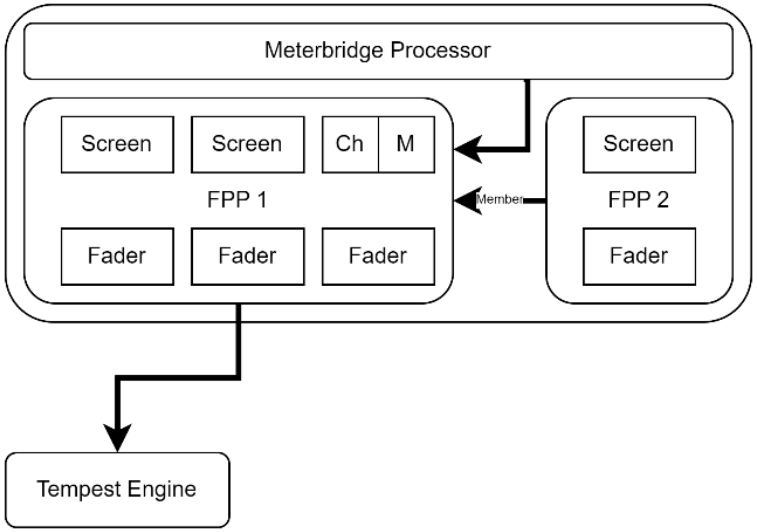
Member Surface Additions

From V4.0, System T control surface positions configured as a **Member** gain the ability to switch into **Remote** mode. A new button in the **Setup | Options | Surface Connectivity** tab provides the ability to switch between modes. Access to this function is controlled through a new addition to Access Control: **Options – Surface Control Mode**.

The new connectivity options provide additional solutions when considering remote production and backup surface requirements. Some key applications are detailed in the following sections, but this is not an exhaustive list. Please speak with your SSL Sales or Support representative for further information.

Background Information

System T control surfaces allow additional control surfaces or FPPs (Front Panel Processors) to be connected as either a **Remote** or **Member** to the main control surface. **Remote** connections are ad hoc: they are made when they are needed, easily managed through the System T GUI. This is typically a surface or TCA (previously T-SOLSA) providing either an additional user position or remote control from another location. **Member** connections are more permanent – they will automatically connect on boot, with settings stored in configuration files. This is typically a second/third FPP in a large S500 or S300-48.



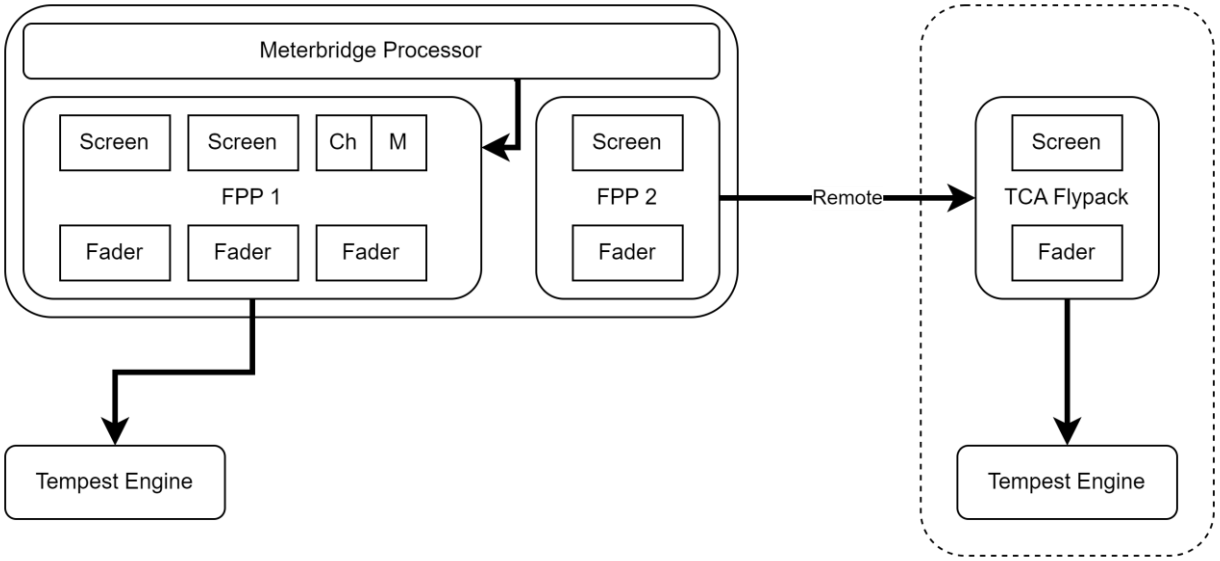
Example of typical Member configuration

Remote Production

With the new Member to Remote functionality available in System T V4.0, the second FPP in a multi-FPP System T control surface can now be used on an ad hoc basis to remotely control another System T control surface.

In the following example a TCA flypack system has been deployed to a remote venue. The main broadcast centre has a dual FPP System T control surface. The second FPP in the main surface can be placed into Remote mode and connected to the TCA, providing control over settings such as mic gains, mix settings and venue foldback mixes. This approach vastly simplifies network requirements between the broadcast centre and remote venue, whilst allowing for low latency venue feeds to be remotely controlled by the operator in the broadcast centre.

The main FPP can be used to combine the remote sources with local sources – e.g. the presentation element from a studio in the broadcast centre – to create the mix for broadcast.



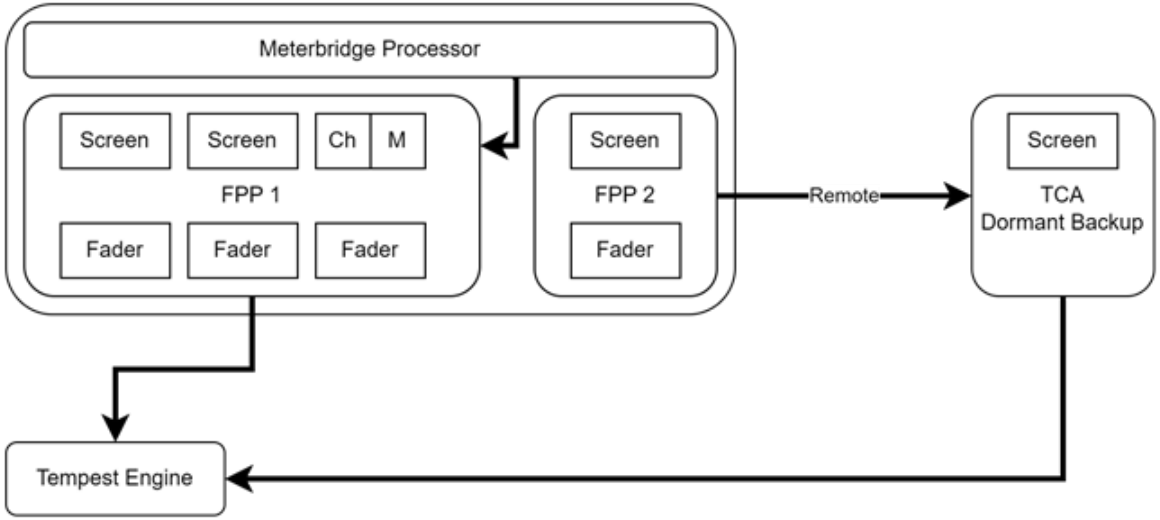
Example of Member being used as physical controls for remote surface

Physical Control for TCA Dormant Backup Surface

System T supports the ability for a control surface to be specified as a **Dormant Backup** – allowing immediate takeover of control from the additional surface. Any surface type can be configured as a Dormant Backup, it does not have to match the physical specification of the main control surface. This is possible thanks to the unified software and complete showfile compatibility across the entire System T range.

With the new **Member to Remote** functionality available in System T V4.0, alongside TCA being available as a Dormant Backup solution, it is now possible for the second FPP in a multi-FPP System T control surface to be utilised as a hardware control surface for a Dormant Backup TCA.

In this example, the second FPP can very simply be placed into Remote mode, connected to the Dormant Backup TCA and provide a level of hardware control for the Dormant Backup TCA from the main mix position**.**



Example of Member being used as physical controls for external Dormant Backup

Query on Single Fader Tile Systems

Query is now available on systems which only have a single fader tile (e.g. a TCR or TCA with fader tile). Previously multiple fader tiles or a Master Tile with Focus Fader were required to enable query. To enable Query on a single fader tile, **Query to Focus Fader** must be selected within **Options | Surface | Query Setup.**

Clear Query must be assigned to a user key to exit **Query** once complete. For single fader tile systems this will mean using an onscreen user key within the Channel View popout.

Network Adaptor Selection Improvements

Improvements have been made to the underlying network adaptor architecture. TCA includes support for more types of virtual network adaptors - used for installations on virtual machines or in remote production environments using software VPNs for secure connectivity.

It is also no longer necessary to restart System T control surfaces (or TCA) when changing Dante, OCP or Studio Integration network adaptor assignment in the **Service | Network** page.

Third Party Touchscreens

System T control surfaces with an external screen output (S300, TCR or single-screen S500) now recognise connection of third-party touchscreens without manual configuration being required. The external display can show any of the Overview, Setup, Automation and Effects views.

Displays must support a resolution of 1920 x 1080 for correct operation. Whilst it is now simpler to connect a third-party touchscreen, it remains the case that the models offered by SSL are the tested and supported models. Testing operation of an alternative screen remains the responsibility of the supplier or end user.

Event Manager Automation Additions

Two new options are available within Event Manager for external control of the active console scene. When triggered, **Select and Fire Next** fires the next scene and selects it, meaning that it is automatically highlighted in the Automation Scene View, Channel Tile automation display, Master Tile automation OLED and shown in the Status Bar scene display. **Select and Fire Prev** provides the same functionality for the previous scene in the scene list. As with **Fire Next** and **Fire Prev**, scenes marked **Skip** in Scene View are not fired when using **Select and Fire Next** or **Select and Fire Prev**.

Other Features and Improvements

- Routing GUI more responsive when moving between routing points
- Status bar messages are now date-stamped (previously timestamped)
- Dante event messages (e.g. sync changes) now included in console logs
- Tile connectivity reliability improvements
- Surface performance improvements through memory optimisations
- Italian added to the external keyboard language selection
- DSP PSU status added to status bar and log files
- Unsupported path types now shown as “-” rather than “0” in Console Configuration page
- SNMP EngineBoots parameter now increments every boot
- Updated TeamViewer installer included in S500/S500m/S300/TCR control surfaces